## IRON AGE Semi-Annual Index

January-June 1963

Volume 191

## Microfilm Copies

Complete microfilm copies of The IRON AGE, text and advertising, are available beginning with Vol. 161 (1948) through the issues covered in this index. For information write to University Microfilms, 313 N. First St., Ann Arbor, Mich.

# IRON AGE

## SEMI-ANNUAL INDEX

January-June 1963

Volume 191

## CLASSIFIED INDEX

### A

### Abrasives

Abrasive Advances Previewed, Apr 11 p 45 Coated Abrasives Descale Steel, Apr 25 p 132
Definite Upswing for Abrasive
Grinding, by K. W. Bennett,
May 9 p 105

### Acme Steel Co.:

Strapping Wraps Up Greater Sales, Feb 7 p 61

### Adams, Dr. Walter:

Price Is 'Weapon', House Told, by R. W. Crosby, June 20 p 60

(dhesives)
Adhesive Bonding Plus Riveting
Lowers Structural Stresses, Jan
17 p 100
Adhesive Gains Challenge PAs,
May 2 p 107
Are You Overlooking Adhesives?
Feb 14 p 116

### See also Bonding

### Aerojet-General:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Aeroprojects Inc.:

The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28 p 69

### Aerospace

Countdown for Metalworking, by R. R. Kay, Mar 28 p 69
Farwest Economy View Good, by R. R. Kay, May 2 p 54
Filament Winding Box' Shapes, Apr 11 p 76
Is U. S. Behind in R & D Race?
By R. H. Eshelman, Mar 21 p
63
Lubricant Resists Thomas 1 p

By R. H. Eshelman, Mar 21 p
63
Lubricant Resists Thermal Shock,
by C. P. Covino, May 16 p 86
Machining René 41 With Heavy
Cuts, Feb 14 p 88
Missiles Get the Billions as Civilian R & D Lags, May 2 p 58
New Product Success Built on Old
Know-How, by T. M. Rohan,
May 9 p 120
New Status, New Uses for Versatile Metal Powders, by C. L.
Kobrin, May 9 p 131
Plastics Launch Space Drive, by
K. W. Bennett, Feb 14 p 52
Plastic Stays Strong at 750 F,
May 16 p 88
Profits from Crash Programs, by
John Di Stefano, Apr 4 p 72
Refractory Metals Made Dense
Through Centrifugal Casting,
Apr 25 p 124
Satellite Motion Rig Orbits on Air
Cushion, June 6 p 51

Scales Tip '62 Record, Mar 14 p

Scales Tip '62 Record, Mar 14 p
130
817 Billion R & D Outlay for '63,
by K. W. Bennett, Jan 3 p 96
SAE Meeting Is Launching Pad
for Space, Defense Research, by
H. F. Jones, Jan 24 p 25
Space Age Demands New Tools,
by R. H. Esbelman, May 16 p 67
Stainless Holds Up Under Heat,
Jan 10 p 62
Surgical Cleaning Aids Missiles,
Feb 28 p 80
Thin Stainless Drawn Extra Deep,
by A. W. Young, Apr 25 p 130
Tighter Gear Standards Coming,
May 23 p 70
Tomorrow's Tooling: Lessons from
Space, by R. H. Esbelman, Apr
18 p 101
Tooling Up for a Moon Shot, by

18 p 101
Tooling Up for a Moon Shot, by
R. H. Eshelman, Apr 4 p 67
Welding Reacts to New Demands,
by R. R. Irving, Apr 4 p 83

### Aerospace Industry

Aerospace Profits Soar Upwards, by R. R. Kay, Apr 4 p 68 Aerospace's Risks Can Hurt, by R. R. Kay, Jan 31 p 44 Does It Pay to Bid for Every Job? by R. R. Kay, June 13 p 114 Sitting on a 86 Billion Back'og, by R. R. Kay, June 3 p 109

### Aetna-Standard, See Blaw-Knox Corp.

### Air Conditioning

Record Year for Air Coolers? Feb 21 p 168

### Aircraft

Air Freight Clear for Takeoff, by R. R. Kay, Apr 18 p 88 Joint Venture, Jan 31 p 44 2100-Mph Transport Brewing, by R. R. Kay, May 23 p 48

### Aircraft Industry

Billion Dollar Project, June 20 p Douglas to Build Compact Jet, by R. R. Kay, Apr 25 p 106

### Air Products Co.:

Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr 18 p 76 Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81

### Air Reduction Co.:

Computer System Makes 'Layout' on Tape for Cutting Contours, Jan 24 p 58
Growing Pains Catch Up With Industrial Gas Industry, by K. K. Bennett, Apr 18 p 76
Welder Rides 'Roller Skate', Mar 14 p 89
Welding Readows No. 1

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Ajax Magnethermic Corp.:

Pushbutton Foundry Pours Brass, Apr 4 p 91

### Alan Wood Steel Co.:

'Local' Human Relations Back-stops Big Steel's Effort, by J. J. McCafferty, May 30 p 91

### Allegheney Ludium Steel Corp.:

Drilling Test Points the Way to Stainless Machinability, Jan 24 p 64

p 64 xtrusion Process Coses in on Thin Steel Sections, by J. H. Rice & L. M. Christensen, Mar 21 p 71 tainless Makers Juggle Prices, by G. J. McManus, Feb 28 p 39

### Allen-Bradley Co.:

Controls, The Vital Link to Productivity, by W. N. Redstreake, June 20 p 83

### Allis-Chalmers Mfg. Co.:

Big Year in Building Equipment? by K. W. Bennett, Feb 28 p 41 Fuel Cells: They're Not Dead! by K. W. Bennett, Apr 18 p 74

### Alloy Steel

Alloy Steels Ride Growth Curve, by G. J. McManus, Feb 21 p 106 Prehardening Boosts Wear Life, May 16 p 92

### Alloyd Electronics Corp.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Alloys Research & Mfg. Corp.:

New Status, New Uses for Versa-tile Metal Powders, by C. L. Kobrin, May 9 p 131

Bar Cuts Hard-Surfaced Parts,
Feb 21 p 139
Grinding Takes on Superalloys
With New Ultrasonic Assist, by
J. E. Sandford, Apr 25 p 121
Low-Cost Honeycomb Makes Bid
as Structural Metal Panel, Feb
21 p 134
Machining René 41 With Heavy
Cuts, Feb 14 p 88
New Status, New Uses for Versatile Metal Powders, by C. L.
Kobrin, May 9 p 131
New Unit Detects Trace Metals,
Mar 28 p 90
Palladium Keeps Hydrogen Pure
for Bright Annealing Lines, Feb
21 p 140

tor bright Annealing Lines, red 21 p 140 Tin-Alloy Toughens Car Engines, by H. F. Jones, Apr 4 p 65 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 1s p 101

### Aluminum

Alumina From Clay Now a 'Suc-cess', May 23 p 37 Aluminum 'Bubbles' Over Can Market, by F. J. Starin, Jan 17

p 69

Aluminum Paces Speed Classic, by R. R. Kay, Feb 21 p 121

Aluminum Pelects Form Sheets, by F. J. Starin, Mar 7 p 102

Aluminum Realigns in Detroit, by H. F. Jones, Feb 21 p 119

Aluminum Takes Lid Off Can Gool, by F. J. Starin, Mar 21 p 45

Aluminum

p 45
Aluminum to Gain Over Record
62, Jan 31 p 94
Anodic Bath Colors Aluminum
Without Using Any Dyes, Mar
28 p 92
Are Aluminum Autos Next? By
H. F. Jones, Feb 14 p 65
Better Ways to Build Better With
Metals, Jan 3 p 100
Cast Slugs Expedite Forging, Jan
31 p 56
Freezer' Makes Metals Stable.
Feb 14 p 89

Treezer' Makes Metals Stable, Feb 14 p 89
GSA Aluminum Bids Raise Shipping Point, by F. J. Starin, June 20 p 55
One-Stop Shopping for Materials, by K. W. Bennett, Apr 4 p 56
Prices Prove Barrier to U. S. Metals Sale, Feb 21 p 172
Quality Program Set for Aluminum Doors, Feb 28 p 106
Reynolds Halts Production of Curtain Walls, Apr 11 p 109
Sealer Extends Rust-Free Life for Metallized Structures, by A. P. Shepard, Apr 11 p 69
Strip Floats Along Coating Line, by H. H. Colson, Feb 21 p 142
Transfer Line Speeds Output of Complex Aluminum Parts, Mar 21 p 76
Transport Is Top Aluminum User, June 27 p 49

21 p 76
Transport Is Top Aluminum User,
June 27 p 49
User Develops Own Aluminum
Sources, Mar 7 p 103
Vacuum Contings Protect Steel at
Temperatures Over 500 F, Jan

Temperature V.24 p 56 24 p 56 Vertical Mill Forms Huge Rings. June 6 p 79 Will Aluminum Hikes Spread? By F. J. Starin, May 9 p 103

### Aluminum Co. of America:

Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81 Tomorrow's Tooling: Lessons fom Space, by R. H. Eshelman, Apr 18 p 101

### Amchem Products, Inc.:

Treatment He'ps Paint Adhesion on Two Kinds of Metal Strip, May 23 p 68

### American Can Co.:

Aluminum 'Bubbles' Over Can Market, by F. J. Starin, Jan 17

### American Cyanamid Co.:

Avoid Static Product Thinking, Feb 21 p 117

### American Economic Foundation:

How Much Depreciation Loss?

### American Gas Furnace Co.:

Heat Treating, by Modules, Apr

### American Iron & Steel Institute, Inc.:

AISI Revises Tool Steel Ratings to Reflect New Technology, by C. L. Kobrin, May 30 p 134

### American Machine & Foundry Co.:

Handy Robot Fills Many Jobs, June 6 p 84 Submerged Arc Links Big Rails With Strong, Hard Welds, Mar 7 p 134
Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### American Motors Corp.:

AM: Akin Under the Skin? Feb 28 p 55 New AM Process Fights Rust, by H. F. Jones, Mar 21 p 59

### American Smelting & Refining Co.:

Chemical Plating Works Quickly on Plain or Intricate Parts, May on Plain or 102. 23 p 72 Lead R&D Grows Product Crop, by F. J. Starin, June 27 p 50

### Amplex Div., See Chrysler Corp.

### Amsted Industries, Inc.:

Steel Auditions Casting Methods, by G. J. McManus, June 20 p 56 Switch to Pressure Pouring Un-grades Sand Castings, by C. L. Kobrin, May 30 p 125

### The Angconda Co.:

Alumina From Clay Now a 'Success', May 23 p 37
Anaconda Mulls Big Chilean Investment, Feb 14 p 120
Dual System Analyzes Metals at
Fast Production Pace, by J. P.
Irwin, May 16 p 90

### Anocut Engineering Co.:

ECM Zeros-In on Heavy Jobs, by C. L. Kobrin, Jan 17 p 95

### Antitrust, See Government; Legislation; Prices

## Appliances

Low Energy Rate Forming Unit Cuts Costs for Short Runs, May 2 p 76 Profits Plague Appliance Men, by T. M. Rohan, Mar 14 p 58

### Arcos Corp.:

Electroslag Unit Welds Plate, Feb 7 p 98
Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Arde-Portland Co.:

Cyrogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81

### Argentina

wgenina
Argentina's Mood: Hope Mixed
With Gloo.1, Mar 28 p 5
Economy Tooling Slashes Costs, by
H. F. Jones, June 20 p 67
Land of Hope—in Need of Help,
by Tom Campbell, Apr 4 p 59
Latin Market Ripe for Presses,
by R. H. Eshelman, Feb 21 p 123

### Armco Steel Corp.:

Al'oy Steels Ride Growth Curve, by G. J. McManus, Feb 21 p 106 Cultivate a Market; Harvest It, by G. J. McManus, June 13 p 103 Grinding Takes on Superalloys With New Ultrasonic Assist, by J. E. Sandford, Apr 25 p 121 New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53

p 53 Silent Force of Ultrasonics, W. N. Redstreake, Feb 28

ainless Alloy Takes New Form, Mar 21 p 74

### Armour Research Foundation

Armour Seeks Broad Use of APT Language, by R. H. Eshelman, May 23 p 49 Fiber Metals: A New Adventure in Engineering Materials, by C. L. Kobrin, Jun 24 p 53 New Status, New Uses for Versa-tile Metal Powders, by C. L. Kobrin, May 9 p 131 The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28 p 69

50 Sound Reveals Stress Patterns, Jan 31 p 58 Spinning Die Forges Billets, Feb

### Art Metal Lighting Div., See Wakefield Corp.

### Association of Consulting Management Engineers:

Wanted More Ability to Adapt, May 9 p 119

### Atlas Steel, Ltd.:

Continuous Casting Takes Off, by G. J. McManus, Mar 21 p 46 New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53

### Atomic Energy

Atom Smasher Puts the Squeeze on Metalworking Tolerances. on Metalworkins Feb 14 p 79 17 Billion R&D Out'ay for '63 by K. W. Bennett, Jan 3 p 96

### Averbach Corp.:

Will Computers Usurp Dec'sions?

### Automatic Timing & Controls, Inc.:

Controls, The Vital Link to Pro-ductivity, by W. N. Redstreake, June 20 p 83

### Automation

Armour Seeks Broad Use of APT
Language, by R. H. Eshelman,
May 22 p 49
Automate Conveyors for Profit,
Jan 24 p 86
Automatic Coll Feeding Setup
Integrates Stamping Lines, by
R. H. Eshelman, May 2 p 72
Automation Job Fund Pays Off,
by R. R. Kay, June 27 p 58
Automation Needs More Volume,
by G. J. McManus, Mar 7 p 101
Big Tables Ride N/C "Cushion"
for Accurate Positioning, Mar 7
p 140
Computer Plots Cutting Logic, by
T. B. Mealy, Apr 18 p 112
Computers Select Best Controls,
Jan 31 p 64
Computer Systems Makes 'Layout'

Jan 31 p 64
Computer Systems Makes 'Layout'
on Tape for Cutting Contours,
Jan 24 p 60
Cutting Costs With Automation,
by R. H. Eshelman, Apr 25 p
105

105
'Early Warning System': Can It
Help Cure Labor's Ills? By J. J.
McCafferty, Mar 21 p 43
Engineers Go Back to College, by
J. D. Baxter, Feb 21 p 108

Europeans Push Automatic Gag-ing, by R. H. Eshelman, June 6

Finishing Line Goes Continuous With Automatic Vibrator, June 13 p 134 Handy Robot Fil's Many Jobs,

June 6 p 84 ow Tooling Holds the Line Against Short-Run Costs, May 16 p 84

Against Short-Run Costs, May 16 p 84 Italy's Ripe for Automation, by R. M. Bednar, Feb 28 p 45 Machine Automates Short Runs, Jan 17 p 99 Numerical Control Tools Poise for a Big Jump in Numbers, by R. H. Eshelman, Jan 31 p 25 Packaging Line Seals Profits by Automating Short Runs, Feb 7 p 88

Pierce Nut Simplifies Assembly in Automated Short-Run Lines.

Automated Short-Run Lines, Feb 14 p 84 ushbutton Foundry Pours Brass, Apr 4 p 91

Pushbutton Foundry Pours Brass,
Apr 4 p 91
Sensors Prom'se to Close Loop on
Control of Molten Metal, by W.
N. Redstreake, June 27 p 73
Shop Dials for Uniform Forgings,
by C. L. Kobrin, Mar 28 p 81
Tape Control Pavs Its Way on
Large Boring Mill, Apr 11 p 80
Tape Control Stars in Air Force
Film, by R. H. Eshelman, Apr
11 p 53
Train Students Early for N/C, by

Train Students Early for N/C, by R. H. Eshelman, Jan 24 p 43 Transfer Line Moves Crankshafts Through Fast Grinding Cycle, Feb 14 p 82 Transfer Line Speeds Output of Complex Aluminum Parts, Mar 21 p 76 Transfer Machine Flexibility Grows, by R. H. Eshelman, May 9 p 117 What's Next Automation Step? By R. H. Eshelman, Mar 28 p 71

### See also Data Processing; Electronic Devices & Controls: Machine Tools: Process Control

### Automobiles & Trucks

Aluminum Paces Speed Classic, by R. R. Kay, Feb 21 p 121

AM: Akin Under the Skin? By H. F. Jones, Feb 28 p 55

Are Aluminum Autos Next? By H. F. Jones, Feb 14 p 65

Autos Rev Up Castings Sales, by T. M. Rohan, Jan 24 p 33

Auto Styles Go International, by H. F. Jones, Jan 10 p 39

Best Seller: Chevy by a Mile, by H. F. Jones, Jan 17 p 81

Car Carries Its Own Camper Unit. Apr 11 p 51

Cashing In On Prestige Cars, by H. F. Jones, Jan 29 p 115

Corrosion Fight Aids Stainless, by H. F. Jones, May 9 p 115

Corrosion War Roosts Zine Use, by H. F. Jones, Mar 7 p 117

Detroit Won't Spare the Horses, by H. F. Jones, Mar 7 p 117

Detroit Won't Spare the Horses, by H. F. Jones, Jan 3 p 98

Economy Tooling Slashes Costs, by H. F. Jones, Jan 3 p 98

Economy Tooling Slashes Costs, by H. F. Jones, Jan 20 p 67

Ford Backtracks for Ideas, by H. F. Jones, Mar 28 p 67

Hawks, Larks Fly Into Spring, by H. F. Jones, Jan 31 p 43

More Rapid Auto Style Changes Keep Toolmakers Busy on '65s, by H. F. Jones, Jan 21 p 59

New AM Process Fights Rust, by H. F. Jones, Mar 21 p 59

New YW Aims at Inroads Here, by H. F. Jones, May 2 p 51

Plastics Launch Space Drive, by H. F. Jones, May 2 p 51

Plastics Launch Space Drive, by R. R. Kay, May 16 p 66

Transfer Machine Flexibility Grows, by R. H. Eshelman, May 9 p 117

### Automobiles & Trucks, Engines & Parts

Aluminum Realigns in Detroit, by H. F. Jones, Feb 21 p 119 Autos Nudge Nuts, Bolts to '62 Record, by T. M. Rohan, Feb 21 p 107

Chrysler Revs Up Its Turbine, by H. F. Jones, May 16 p 65
Hydroform Improves Deep Draw, by R. H. Eshelman, Jan 24 p 58
Is the Turbine Just a Gimmick or the Next Auto Power Plant?
By H. F. Jones, May 23 p 33
J & L. Tosses Hat in Trim Ring, by H. F. Jones, Apr 18 p 85
New Frames to Aid Flexibility, by H. F. Jones, June 13 p 113
New Process Plates Plastics, Apr 11 p 82

New Process Plates Plastics, Apr 11 p 82 Nickel Plate Could Make Cents, by H. F. Jones, June 27 p 57 Powder Metallursy Gets a Boost from New Metals and Controls, Jan 31 p 53 Tape Simulates Engine Runs, by R. H. Eshelman, Feb 7 p 90 Thin Shafts Come Out Straight After Precision Heat Treat, by R. H. Eshelman, Mar 28 p 88 Fin-Al'oy Toughens Car Engines, by H. F. Jones, Apr 4 p 65 Transfer Line Speeds Output of Compkex Aluminum Parts, Mar 21 p 76 Turbine Meets Military Needs, by

21 p 76
Turbine Meets Military Needs, by
H. F. Jones, Mar 14 p 67
Versatile Design Spurs Savings,
by R. H. Eshelman, Jan 17 p 85
What's Next Automation Step? By
R. H. Eshelman, Mar 28 p 71
Why Stainless Prices Were Cut, by
G. J. McManus, Jan 10 p 26

### Automotive Industry

Automotive Industry

Boom Auto Sales Stir Detroit, by H. F. Jones, Apr 11 p 40
Chrysler Hunts Markets Abroad, by H. F. Jones, Apr 25 p 103
Everyone Backs Up Warranties, by H. F. Jones, Feb 7 p 71
Ford, Chevy Arm for '64 Fray, by H. F. Jones, May 23 p 47
Foreign Cars Tailored to Fit U. S. Market, Apr 25 p 97
GM to Push Chevy Sales in 1964, by H. F. Jones, June 6 p 57
Midyear Metalworking Forecast, June 13 p 119
Plant Spending Is on the Move, by J. D. Baxter, Mar 7 p 111
Record Year for Truck Sales?
By H. F. Jones, May 30 p 105
Tool Spending by Automakers Due for Hike in 1964 Models, by H. F. Jones, Mar 28 p 45
UAW Stiffens White Collar Push, by H. F. Jones, May 23 p 38
Why Automakers OK UAW Study Plan, by H. F. Jones, May 23 p 38
Why Automakers OK UAW Study Plan, by H. F. Jones, May 25 p 95
Will '63 Auto Sales Top '62? By H. F. Jones, Jan 3 p 107

### Avco Corp.:

Success in Research Can't Be Bought, Jan 31 p 38

### B

### Babcock & Wilcox Co.:

Roanoke Casting Unit Now Operating, May 16 p 59

### The Baird Machine Co.:

Matching Four Slide Machines to the Right Forming Job, Feb 7

### Baldwin-Lima-Hamilton Corp.:

Atom Smasher Puts the Squeeze on Metalworking Tolerances, on Metalworking Tolerances, Feb 14 p 79 Forus Shop Gets Quality Hike, Feb 21 p 138

### Bank of America

Farwest Economy View Good, by R. R. Kay, May 2 p 54

### W. F. & John Barnes, Co.:

Transfer Machine Flexibility Grows, by R. H. Eshelman, May 9 p 117

### Bars & Shapes

Bar Mills Launch Quality Drive, by T. M. Roban, Jan 10 p 31 Stamping Huge Shapes to Size, by Federico Strasser, Mar 7 p 136 Steel Bars Climb to 400,000 Psi, by C. L. Kobrin, Feb 7 p 85

### Basic Systems, Inc.:

Programming — New Fail-Proof Way to Train, by P. J. Cathey, June 20 p 72

### Battelle Memorial Institute, Inc.:

\$17 Billion R&D Outlay for '63, by K. W. Bennett, Jan 3 p 96 Tame the Information Flooditide, Apr 11 p 55 Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Battle Creek Packaging Machines, Inc.:

Packaging Line Seals Profits by Automating Short Runs, Feb 7 p 88

### Morris Bean & Co.:

New Technology Key to Casting Growth, by C. L. Kobrin, May 16 p 56

### Bearings

Bearing System Refines Rolling, May 9 p 144 Distributor Is One-Stop Mart, Apr 18 p 169 Engineers Call Halt to Rejects, by J. E. Sandford, Feb 21 p 131 How to Curb Sliding Friction, June 13 p 136 SKF Rolling Bearing Research Plant Opens, June 20 p 62

### Behr-Manning Co. See Norton Co.

### Bendix Corp.:

Numerical Control Tools Poised for a Big Jump in Numbers, by R. H. Eshelman, Jan 31 p 25

### Beryllium Corp.:

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

### Birdsboro Corp.:

Rolls Changed by Push Button, June 13 p 142

### Black, Sivalls & Bryson, Inc.:

Fiber Glass Invades Tank Car Market, Apr 18 p 79

### Blaw-Knox Corp:

Magnets Attract Big Cost Sav-ings, May 9 p 191

### Blough, Roger

PAs Hold Key to Industry Growth, June 20 p 135

### E. W. Bliss Corp.:

New Status, New Uses for Versa-tile Metal Powders, by C. L. Kobrin, May 9 p 131

### The Boeing Co.:

Adhesive Bonding Plus Riveting
Lowers Structural Stresses, Jan
17 p 100
Aerospace Profits Soar Upwards,
by R. R. Kay, Apr 4 p 68
Joint Venture, Jan 31 p 44
TV Finds Flaws Inside Tubing,
by A. W. Young, June 27 p 7

### Bonding

Adhesive Bonding Plus Riveting Lowers Structural Stresses, Jan

Fiber Mat Gets Extra Strength as Plastic Bonds It in Place, June 27 p. 78

27 p 78 Foam-Metal Construction Panels Shave On-Site Building Costs,

Foam-Metal Construction Panels Shave On-Site Building Costs, Jan 10 p 52 Low-Cost Honeycomb Makes Bid as Structural Metal Panel, Feb 21 p 134 Pierce Nut Simplifies Assembly in Short-Run Lines, Feb 14 p 84 Powder Reacts to Form Coating, May 2 p 82

### See also Adhesives; Joining; Welding & Welding Machines

### Borg-Warner Corp.:

Profits from Crash Programs, by John Di Stefano, Apr 4 p 72 PAs Share in Information Pool, Feb 28 p 102

### Boring

Boring Mill Shapes Big Sphere, by R. H. Eshelman, May 30 p 128 Tape Control Pays Its Way on Large Boring Mill, Apr 11 p 80

### Baulwareism, See Industrial Relations

## Broeburn Alloy Steel Div., See Continental Copper & Steel Industries

### British Iron & Steel Research Ass'n:

Tinplate Gets 'Instant' Anneal. Apr 25 p 129

### Branson Instruments, Inc.:

The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28 p 69

### Brass

Pushbutton Foundry Pours Brass, Apr 4 p 91

A Time to Watch and Wait, by Tom Campbell, Mar 28 p 48

Brazing Tackles New Jobs, by K. W. Bennett, Feb 7 p 66 Low-Cost Honeycomb Makes Bid as Structural Metal Panel, Feb 21 p 134

### Bridgeport Brass Co.:

Low-Cost Honeycomb Makes Bid as Structural Metal Panel, Feb 21 p 134 Mill Speeds Scrap Processing, Feb

### Brown & Sharpe Mfg. Co.:

N/C Language Uses 'Plain Talk' to Program Turret Drill Jobs, by A. W. Young, Apr 4 p 94

### Brubaker Tool Corp.:

'Specials': Profit or Grief? By R. M. Bednar, Jan 17 p 68

Boom Auto Sales Stir Detroit, by H. F. Jones, Apr 11 p 40 Budd Modernizes, Mar 14 p 71 EDP Is a Winner as PA Right Arn, Apr 11 p 111 Thin Stainless Drawn Extra Deep, by A. W. Young, Apr 25 p 130

### The Bullard Co.:

Machine Tool Orders Ride High, Apr 4 p 53

### **Bureau of National Affairs**

Rewards for Special Efforts? Mar 7 p 109

### Burroughs Corp.:

No Longer a 'Necessary Evil', Jan 3 p 210

### Business, See Forecasting; Industrial Expansion; Management; individual industries

Business Issues, See Beaudet, E.C.

### Cadmium

Cadmium Price Woes Dull Plating Outlook, by F. J. Starin, May 16 p. 55

### Calex Corp.:

Commercial Zinc Extruding Nears, by F. J. Starin, June 6 p 49

### Calstrip Corp.:

Line Anneals and Cleans Strip, June 13 p 141

### Canada

Canada's Course: A Difficult Route For Outsiders, by E. C. Reaudet, June 27 p 116 Canada's Discriminatory Taxes Hit U. S. Industry Hard, June 27 p. 46

### Capital Goods, See Industrial Expansion; individual industries

### Carboline Co.:

Rust Converted to Useful Oxides, May 16 p 93

### Carborundum Co.:

New Status, New Uses for Versa-tile Metal Powders, by C. L. Kobrin, May 9 p 131 Oxide Film Passes Fiery Tests as Refractory Heat Shield, Mar 21

### Carpenter Steel Co.:

Stainless Holds Up Under Heat, Jan 10 p 62 Ultra-sonic Machine Cleans Steel on a Continuous-Strip Basis, by A. W. Young, Apr 18 p 109

### Carr Fastener Co.:

New Process Plates Plastic, Apr 11 p 82

### Case, Senator Clifford

Safeguards Needed for Contract Integrity, by R. W. Crosby, Apr 11 p 56

### Castings

Clean Room Improves Castings. June 27 p 83

Heat-Proof Paints Save Molds,
Feb 28 p 77

Nylon Cast Into Big Gears, by
Ralph James, Feb 7 p 92 Portable Crucible Heats Itself, June 20 p 93 Refractory Metals Made Dense Through Centrifugal Casting, Apr 25 p 124

### Casting, Continuous

Costing, Continuous

Big Step for Continuous Casting, by G. J. McManus, Jan 24 p 27

Continuous Casting Going Tonnage-Scale, May 16 p 59

Continuous Casting Takes Off, by G. J. McManus, Mar 21 p 46

Geiger Tube Paces Continuous Casting, June 6 p 85

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 47

New Drive Behind Continuous Casting, by G. J. McManus, June 20 p 56

User Develops Own Aluminum Sources, Mar 7 p 103

### Castings, Ferrous

Autos Rev Up Castings Sales, by T. M. Rohan, Jan 24 p 33
Borings Make Quality Castings. Jan 31 p 60
Can Ductile Iron Do Steel's Job?
By T. O. Kuivinen, June 27 p 84
Can Quality Offset Low Bidding?
Jan 10 p 86
How Much Waste in Castings? By T. M. Rohan, June 6 p 46
Steel Auditions Casting Methods. by G. J. McManus, June 20 p 56

### Castings, Nonferrous

Cast Slugs Expedite Forging, Jan 31 p 56 Pushbutton Foundry Pours Brass, Apr 4 p 91

### Casting, Sand

Switch to Pressure Pouring Up-grades Sand Castings, by C. L. Kobrin, May 30 p 125

### Caterpillar Tractor Co.:

Big Year in Building Equipment? By K. W. Bennett, Feb 28 p 41

## Cavitron Ultrasonics, Inc.:

The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28 p 69

### Ceramics

Ceramic and Plastic Team Up. May 30 p 136 Cyclic Strain Hardens Ceramics, Apr 11 p 79 Dense Ceramic Takes High Heat, Mar 14 p 91

### Cerro Copper & Brass Co.:

Cast Slugs Expedite Forging, Jan 31 p 56

### Chemetron, Inc.:

Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr 18 p 76

### Chemical Micro Milling Co.:

Photo-Etch Forms Minute Parts, June 20 p 91

### Chemicals

Foam-Metal Construction Panels Shave On-Site Building Costs, Jan 10 p 52

## Chicago Powdered Metals Co.:

Furnace Upgrades Powder Parts to Meet Design Challenge, by J. E. Miller, Mar 14 p 92

### China

S. Holds Tungsten Trump, by F. J. Starin, Feb 28 p 43

### Chrysler Corp.:

Chrysler Corp.:

Chrysler Hunts Markets Abroad, by H. F. Jones, Apr 25 p 103

Chrysler Revs Up Its Turbine, by H. F. Jones, May 16 p 65

Design Opportunities Widen Widen Willer Plastics Materials, June 13 p 138

Is the Turbine Just a Gimmick or the Next Auto Power Plant? By H. F. Jones, May 23 p 33

New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53

New Status, New Uses for Versatile Metal Powders, by C. L. Kobrin, May 9 p 131

New Status, New Uses for Versatile Metal Powders, by C. L. Kobrin, May 9 p 131
Tin-Alloy Toughens Car Engines, by H. F. Jones, Apr 4 p 65
Tomorrow's Tooling: Lessenon from Space, by R. H. Eshelman, Apr 18 p 101
Turbine Meets Military Needs, by H. F. Jones, Mar 14 p 67
What's Next Automation Step? By R. H. Eshelman, Mar 28 p 71

### Cincinnati Milling Machine Co.:

Expert Views World Tool Market, by R. H. Eshelman, Jan 10 p 41 Hydroform Improves Deep Draw, by R. H. Eshelman, Jan 24 p 58 Labets Shop, Tarkets Lab-to-Shop Technology Gains, by C. L. Kobrin, Apr 18 p 78

### Cladmetal Div., See Bridgeport Brass Co.

### Clad Metals

Heat-Treat Line for Wide Plate Accents 'Specialty' Trend, by C. L. Kobrin, Mar 7 p 131 Plastics Launch Space Drive, by K. W. Bennett, Feb 14 p 52 Tomorrow's Tooling; Lessons from Space, by R. H. Eshelman, Apr 18, p. 130 Space, by 18 p 101

Vacuum Coatings Protect Steel at Temperatures Over 500 F. Jan 24 p 56

### Clark Controller, Inc.:

Controls, The Vital Link to Pro-ductivity, by W. N. Redstreake, June 20 p. 83

### Clark Equipment Co.:

Big Year in Building Equipment? By K. W. Bennett, Feb 28 p 41

### Cleaning & Finishing

Acid Line Cleans Various Gages,

Jan 24 p 63 nodic Bath Colors Aluminum Without Using Any Dyes, Mar 28 p 92 ar Cuts Hard-Surfaced Parts,

Bar Cuts Hard-Surfaced Parts, Feb 21 p 139 Chemical Plating Works Quickly on Plain or Intricate Parts, May 23 p 72 Finishing Line Goes Continuous With Automatic Vibrator, June

13 p 134 oam Halves Packaging Costs,

Foam Halves Packaging Costs, Feb 21 p 144 Gas Dryer Yields Brighter Steel, Mar 7 p 142 Line Anneals and Cleans Strip, June 13 p 141 New Process Plates Plastics, Apr

New Fricess rates rates 1 1 p 82 11 p 82 Nickel Plate Could Make Cents, by H. F. Jones, June 27 p 57 Rust Converted to Useful Oxides, May 16 p 93 The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28

p 69
Steel Gets Fast Shave and Draw
in New Finishing Process, May
30 p 130
Strip Floats Along Coating Line,
by H. H. Colson, Feb 21 p 142
Surgical Cleaning Aids Missiles,
Feb 28 p 80

## Treatment Helps Paint Adhesion on Two Kinds of Metal Strip, May 23 p 68 Ultrasonic Machine Cleans Steel

trasonic Machine Cleans Steel on a Centinuous-Strip Basis, by A. W. Young, Apr 18 p 109 acuum Coatings Protect Steel at Temperatures Over 500 F. Jan

Temperatures Over 500° F, Jan 24 p 56° Vacuum Metallizing of Plastic Sparks New Product Designs, by L. A. Clement, Feb 14 p 86° Weld Cleaning Time Tumbles, Apr 11 p 78° Zinc Coatings Step Up R&D, by J. J. McCafferty, June 20 p 58°

### See also Corrosion: Paints & Painting; Ultrasonics

### Clevite Corp.:

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

### Coal & Coke

Natural Gas Aids Ironmaking, Mar 28 p 94 Soft Coal's Soft Sell in Labor, by G. J. McManus, May 16 p 54

Automatic Coil Feeding Setup Integrates Stamping Lines, by R. H. Eshelman, May 2 p 72 Painted Steels Parade Lures Mills to March, by G. J. McManus, May 30 p 98 Strip Floats Along Coating Line, by H. H. Colson, Feb 21 p 142

### Common Market, See Europe; Foreign Trade

### Computers, See Data Processing; Process Control

### Concast, Inc.:

Steel Auditions Casting Methods, by G. J. McManus, June 20 p 56

### Connors Steel Div., See H. K. Porter, Inc.

### Consolidated Mining & Smelting Co. of Canada, Ltd.:

Commercial Zinc Extruding Nears, by F. J. Starin, June 6 p 49

### Construction

Anodic Bath Colors Aluminum Without Using Any Dyes, Mar

Without Using Any Dyes, Mar 28 p 92 Better Ways to Build Better With Metals, Jan 3 p 100 Big Year in Building Equipment? By K. W. Bennett, Feb 28 p 41 Builders Again Led Steel Users.

Builders Again Led Steel Users, May 2 p 42 Coast Mills Predict '63 Gains, by R. R. Kay, Jan 10 p 40 Foam-Metal Construction Panels Shave On-Site Building Costs, Jan 10 p 52 Hawaiians Eye Business Boom, by R. R. Kay, Feb 14 p 67 Low-Coat Honeycomb Makes Bid as Structural Metal Panel, Feb 21 p 134

21 p 134
Midyear Metalworking Forecast,

Midyear Metalworking Forecast, June 13 p 119 Portable Tools Speed Assembly of Structural Steel Parts, by Harry Conn, Jan 10 p 80 Quality Program Set for Alumi-num Doors, Feb 28 p 106 Reynolds Halts Production of Cur-tain Walls, Apr 11 p 109 Users Build 60-Day Steel Supply, Feb 14 p 51

### See also Structural Steel

### Container Corp.:

New Contender for Can Market, by K. W. Bennett, May 2 p 40

### Containers

Aluminum 'Bubbles' Over Can Market, by F. J. Starin, Jan 17 p 69 Aluminum Takes Lid Off Can Goal, by F. J. Starin, March 21

45

tool, by F. J. Starin, March 21
p. 45
Billing Delayed on Tinplate, Feb
28 p. 40
Cryogenies: Industry's New World
of Ultracold, by C. L. Kobrin,
Mar 14 p. 81
New Contender for Can Market,
by K. W. Bennetet, May 2 p. 40
Steelmaker to Push Canned Soft
Drinks, Feb 14 p. 55
Strip Floats Along Coating Line,
by H. H. Colson, Feb 21 p. 142
Users Build 60-Day Steel Supply,
Feb 14 p. 51

### See also Packaging

### Continental Copper & Steel Industries:

Defense Spurs Vacuum Treating, by G. J. McManus, Jan 31 p 31

### Conventions

Design Experts Meet, May 9 p 155 1963 Meetings and Conventions, Jan 3 p 171 Tool Experts Meet, Apr 18 p 132

### See also Exhibitions

### Conveyor Equipment Manufacturers Assn.:

Automate Conveyors for Profit. Jan 24 p 86

### The Cooper-Bessemer Corp.:

Can Ductile Iron Do Steel's Job? By T. O. Kuivinen, June 27

Tape Control Pays Its Way o... Large Boring Mill, Apr 11 p 86

### Copper

Anaconda Mulls Big Chilean Investment, Feb 14 p 120
Copper Industry Upturn Continues, Mar 21 p 110
Dual System Analyzes Metals at Fast Production Pace, by J. P. Irwin, May 16 p 90
New Year Ushers in New Copper Group, Jan 10 p 90
Will Copper Price Remain Stable?
By F. J. Starin, Mar 28 p 50

### Copperweld Steel Co.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

Corrosion Fight Aids Stainless, by
H. J. Jones, Jan 24 p 41
Corrosion War Boosts Zinc Use,
by H. F. Jones, Mar 7 p 117
Does Humidity Controls Pay for
Rust Prevention? June 27 p 80
New AM Process Fights Rust, by
H. F. Jones, Mar 21 p 59
Nickel Plate Could Make Cents,
by H. F. Jones, June 27 p 57
Rust Converted to Useful Oxide,
May 16 p 93

Rust Converted to Useful Oxide. May 16 p 93 Sealer Extends Rust-Free Life for Metallized Structures, by A. P., Shepard, Apr 11 p 69 Vacuum Coatings Protect Steel at Temperatures Over 500 F, Jan 24 p 56 Zinc Coatings Step Up R&D, by J. J. McCafferty, June 20 p 58

Cornelius Cremer & Co.: Rust Converted to Useful Oxides, May 16 p 95

### Cromwell Paper Co.:

New Contender for Can Market, by K. W. Bennett, May 2 p 40

### Crucible Steel Co. of America

Stainless Makers Juggle Prices, by G. J. McManus, Feb 28 p 39

### Cryonetics Corp.:

Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81

### Cryogenics, See Metallurgy

### Curtiss-Wright Corp.:

Drill System Keeps Holes True, Mar 21 p 84 Mar 21 p 84 ammoth Press Runs Gamut of Steel Extrusion Jobs, Jan 10 p 56

### Cutler-Hammer, Inc.:

Big Tables Ride N/C "Cushion" for Accurate Positioning, Mar 7 p 140 Controls, The Vital Link to Pro-ductivity, by W. N. Redstreake, June 20 p 83

### D

### Dalton Foundries, Inc.:

Clean Room Improves Castings, June 27 p 83

### **Data Processing**

Computer Plots Cutting Logic, by
T. B. Mealy, Apr 18 p 112
Computers: Mature, But Growing, by K. W. Bennett, May 23 p 36
Computers Select Best Controls, Jan 31 p 64
Computer System Makes 'Layout' on Tape for Cutting Contours, Jan 24 p 58
Computer Ties in Diverse Data, May 2 p 78
Drive to Improve Defense Buying Advances Into New Stage, by P. J. Cathey, Feb 14 p 60
EDP Is a Winner as PA Right Arm, Apr 11 p 111
Get the Best From Your Computer, Apr 25 p 109
'Intellectronics' and Management, by R. R. Kay, May 30 p 106
N/C Language Uses 'Plain Talk' to Program Turret Drill Jobs, by A. W. Young, Apr 4 p 94
Slide Rule Maps Critical Paths, June 13 p 144
Tape Simulates Engine Runs, by R. H. Eshelman, Feb 7 p 90
Will Computers Usurp Decisions?

Mar 14 n 65

### See also Process Control

### Decatur Aluminum Co.:

User Develops Own Sources, Mar 7 p 103 Aluminum

Aeroscace Profits Soar Upwards, by R. R. Kay, Apr 4 p 68
Coast Defense Work to Hold Up, by R. R. Kay, June 20 p 68
Defense Streamlines Tool Setup, by R. H. Eshelman, Feb 14 p 69
Drive to Improve Defense Buying Advances Into New Stage, by P. J. Cathey, Feb 14 p 66
Hawaiians Eye Business Boom, by R. R. Kay, Feb 14 p 67
Military Phases—In Supply Network, Apr 18 p 73
Pentagon Tightens Contracting Rules, by R. W. Crosby, June 13 p 102
Safeguards Needed for Contract Integrity, by R. W. Crosby, Apr 11 p 56

Sitting on a 86 Billion Backlog, by R. R. Kay, Jan 3 p 109 SAE Meeting Is Launching Pad for Space, Defense Research, by H. F. Jones, Jan 24 p 25 Tape Control Stars in Air Force Film, by R. H. Esbelman, Apr 11 p 53 Turbine Meets Military Needs, by H. F. Jones, Mar 14 p 67

### See also Purchasing, Government

### deHaviland Aircraft of Canada, Ltd .

Short-Haul Jet, May 9 p 116

### Design

Auto Styles Go International, by H. F. Jones, Jan 10 p 39
Design Experts Meet, May 9 p 155
Design Opportunities Widen With Plastics Materials, June 13 p 138
Designers Fight Valve Fatigue
With Salt Bath Treatment, by D. R. Dorff, Jan 10 p 54
Furnace Upgrades Powder Parts
to Meet Design Challenge, by J. E. Miller, Mar 14 p 92
Low-Cost Honeycomb Makes Bid as Structural Metal Panel, Feb 21 p 134
Materials Battle Grows Hotter, by F. J. Starin, May 30 p 94
New Process Plates Plastics, Apr 11 p 82
Vacuum Metallizing of Plastic Sparks New Product Designs, by L. A. Clerent, Feb 14 p 86

### Detroit Edison Co.:

Continuous Testing Coming for Steel? By J. J. McCafferty, Apr 18 p 75

### Devcon Corp.:

Synthetic Rubber Cures at 70 F, June 27 p 86

### DeVlieg Machine Co.:

Boring Mills Shapes Big Sphere, by R. H. Eshelman, May 30 p 128

### Diebold, John

Computers: Mature, But Growing, by K. W. Bennett, May 23 p 36 Space Age Demands New Tools, by R. H. Eshelman, May 16 p 17

Conrols Prevent Die Damage, Apr Conrols Prevent Die Damage, Apr 18 p 114 Low Energy Rate Forming Unit Cuts Costs for Short Rubs, May 2 p 76 Spinning Die Forges Billets, Feb 7 p 96 Stamping Huge Shapes to Size, by Federico Strasser, Mar 7 p by 136

### Diesels

Tape Control Pays Its Way on Large Boring Mill, Apr 11 p 80

### Dietz Machine Works:

New Contender for Can Market, by K. W. Bennett, May 2 p 40

### Diversification, See Management

### Double A Products Co.:

Designers Fight Valve Fatigue With Salt Bath Treatment, by D. R. Dorff, Jan 10 p 54

## Douglas Aircraft Co.:

Douglas to Build Compact Jet, by R. R. Kay, Apr 25 p 106 Short-Haul Jet, May 9 p 116 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

### The Dow Chemical Co.

Foam-Metal Construction Panels Shave On-Site Building Costs, Jan 10 p 52 New Gas Speeds Flame Cutting, Apr 11 p 72

### **Drafting Equipment**

Computer Plots Cutting Logic, by T. B. Mealy, Apr 18 p 112 Computer System Makes 'Layout' on Tape for Cutting Contours, Jan 24 p 60

### Dravo Corp.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

### Drawing

Hydroform Improves Deep Draw, by R. H. Eshelman, Jan 24 p 58 Thin Stainless Drawn Extra Deep, by A. W. Young, Apr 25 p 130

### Drever Co.

Heat-Treat Line for Wide Plate Accents 'Specialty' Trend, by C. L. Kobrin, Mar 7 p 131

### Drilling

Drilling Test Points the Way to Stainless Machinability, Jan 24 Drill System Keeps Holes True, Mar 21 p 84

Solid-State Drives Save Space, Jan 31 p 63

### Drucker, Peter

Will Computers Usurp Decisions? Mar 14 p 69

Can Ductile Iron Do Steel's Joh? by T. O. Kuivinen, June 27 p 84

### Dumping, See Foreign Trade

E

### E. I. du Pont de Nemours & Co., Inc.:

Plastie Stays Strong at 750 F, May 16 p 88 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

### The East Ohio Co.:

Natural Gas Aids Ironmaking, Mar 28 p 94

### Eastern Rolling Mills, Inc.:

Bearing System Refines Rolling, May 9 p 144

### Eastman Kodak Co :

Billing System Covers 'Extras', Mar 7 p 139 New Cameras Change Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p 56

### Editorials

merica's Good Face: As an Englishman Sees Us! June 13 p America the Beautiful: Sucker, Dunce, or Savior? Apr 4 p 5 American Paradoxes: They Hurt Us Externally, May 16 p 5

Anti-Americanism: Fact, Fiction or Symbol? Mar 21 p 5
Argentina's Mood: Hope Mixed With Gloom, Mar 28 p 5
Big Miracle in Steel: And a New Phase Begins! June 27 p 5
A Case in Point: And It's About Profits! Jan 31 p 5
Coming Tax Revolt: It's in the Making Now! May 23 p 5
Communistic Cuba: Launching Pad for the Reds! May 2 p 5
The Death of Leadership: Has That Time Really Come? June 20 p 5

That Time Really Come; 20 p 5
Diplomatic Stupidity: That's Our
Canadian Stance! Feb 14 p 5
For the Long Pull, There's More
Than Just Hope! Jan 10 p 5
Free World Chaos: Seeds Being
Sown Now? Feb 7 p 5
How to Be an Executive: But
Remember, It isn't Easy! Jan
3 p 5

Remember, It isn't Easy! Jan
3 p 5
Latin Progress: It Will Take
Ages! Apr 25 p 5
Operation Flyspeck: That's What
We Are Into! Apr 11 p 5
Out in Left Field: Where Our
Economics Is! Feb 21 p 5
A Realistic Policy: We Need It
in Latin America, Mar 14 p 5
South America: Have We Lost
Contact? Mar 7 p 5
Space Progress: Great! How About
Human Progress? May 30 p 5
Steel Labor Haspens, May 9
p 5
Steel Labor Out'ook: At First

a Big Miracle Happens, May 9 p 5
Steel Labor Out'ook: At First Glance, Not Rocky! Jan 17 p 5
Steel Price Outlook: It's Anything But Simple, Apr 18 p 5
Steel Service Center: Experiment in Survival, June 6 p 5
To Uncharted Seas: That's Where We're Headed! Jan 24 p 5
Western Cohesion: Or Is It Adhesion? Feb 28 p 5

### Education

Engineers Go Back to College, by J. D. Baxter, Feb 21 p 108 Is U. S. Behind in R & D Race? By R. H. Eshelman, Mar 21 p 63 Train Students Early for N/C, by R. H. Eshelman, Jan 24 p 43

### See also Training Programs

### **Electrical Equipment**

Automation Needs More Volume, by G. J. McManus, Mar 7 p 101 Marnet Turns Memory On, Off, Feb 14 p 92 Plant Spending Is on the Move, by J. D. Baxter, Mar 7 p 111 Solid-State Drives Save Space, Jan 31 p 63

## Electrical Testing Laboratories, Inc.:

Quality Program Set for Alumi-num Doors, Feb 28, p 106

## Electrochemical Industries, Inc.:

New Process Plates Plastics, Apr 11 p 82

## Electronic Associates, Inc.:

Computers Select Best Controls, Jan 31 p 64

### Electronic Devices & Controls

Electronic Devices & Controls

Bar Mills Launch Quality Drive,
by T. M. Rohan, Jan 10 p 31

Big Tables Ride N/C "Cushion"
for Accurate Positioning. Mar
7 p 140

Computers Se'ect Best Controls,
Jan 31 p 64

Controls Prevent Die Damage, Apr
18 p 144

Controls, The Vital Link to Productivity, by W. N. Redstreake,
June 20 p 83

Electronic Advances, Unveiled, by
F. J. Starin, Apr 4 p 58

Geiger Tube Paces Continuous
Casting, June 6 p 85

How Digital Computer Controls
Oxygen Steelmaking Unit, by
E. J. Borrebach, Mar 21 p 78

Magnet Turns Memory On. Off. Feb 14 p 92 'Memory' Table Aids Assembly, May 30 p 133 Rolls Changed by Push Button,

May 30 p 133
Rolls Changed by Push Button,
June 13 p 142
Shop Dia's for Uniform Forgings,
by C. L. Kobrin, Mar 28 p 81
Tape Simulates Engine Runs, by
R. H. Eshelman, Feb 7 p 90
Tester Speeds Hardness Checks,
May 23 p 74
Thin Shafts Come Out Straight
After Prec'sion Heat Treat, by
R. H. Eshelman, Mar 28 p 88
Tiny Jets Replace Moving Parts
in Process-Control Devices, by
C. L. Mamzie, May 23 p 65
Timer Controls Weld Energy, Jan
24 p 65
Tomorrow's Tooling: Lessons from
Space, by R. H. Eshelman, Apr
18 p 101

### Electronic Equipment

How to Build Reliability In Welded Circuits, by C. R. O'se June 6 y 82

### Electro-Nite, Inc.:

Geiger Tube Paces Continuous Casting, June 6 p 85

## Electroplating

Roiler Restores Plating Baths, Feb 28 p 79 Feb 28 p 79
admium Price Woes Dull Plating
Outlook, by F. J. Starin, May 16

p 55
Chemical Plating Works Quickly
on Plain or Intricate Parts, May
23 p 72
Corrosion War Boosts Zine Use, by
H. F. Jones, Mar 7 p 117
The Silent Force of Ultrasonics,
by W. N. Redstreaks, Feb 28
p 69

### Engelhard Industries:

Palladium Keeps Hydrogen Pure for Bright Annesding Lines, Feb 21 p 140

### Engineers & Engineering

ASTME Pushes Resarch Plan, by R. H. Eshelman, Feb 28 p 59 Design Experts Meet, May 9 p 155 Engineers Go Back to College, by J. D. Baxter, Feb 21 p 108 Forum Trades Tooling Ideas, by R. H. Eshelman, June 20 p 69 Is U. S. Behind in R & D Race? By R. H. Eshelman, Mar 21 p 63

63 Lab-to-Shop Technology Gains, by C. L. Kobrin, Apr 18 p 78 Researchers Eye Manufacturing, by R. H. Eshelman, June 13 p 115

Researchers to Study Metal Design. Output, by R. H. Eshelman. June 27 p 59
817 Billion R&D Outlay for '63, by K. W. Bennett, Jan 3 p 96
SAE Meeting 1s Launching Pad for Space, Defense Research, by H. F. Jones, Jan 24 p 25
Total Quality Concept 1s Goal, by K. W. Bennett, May 30 p 97
Wanted: More Engineer-Leaders, by R. R. Kay, Feb 7 p 73
Why Creative Efforts Rog Down, Feb 14 p 59

### Engines, See Automobiles & Trucks, Engines & Parts

Enthone, Inc., See American Smelting & Refining Co.

### Eriez Mfg. Co.:

Magnets Attract Big Cost Savings, May 9 p 191

Ant.trusters Aim New Actions at Mercers and Foreign Ties, by R. W. Crosby, Jan 10 p 28 Europe No Threat, Stampers Told, by T. M. Rohan, Mar 28 p 47 Shake Off Global Market Jitters, May 23 p 51

### Executives, See Labor; Management; Recruiting; Training Programs

### Exhibitions

AWS Set for Show, Apr 4 p 98 Germany Lures U. S. to a Fair, May 23 p 40 PAs Are Missing Trade Show Boat, Map 30 p 167 Storm Flags Fly at Trade Fair, by K. W. Bennett, June 27 p 48

### See also Conventions

### Export, See Foreign Trade

Commercial Zinc Extruding Nears, by F. J. Starin, June 6 p 49
Extruder Turns Out 85-ft Tubes,
May 2 p 74
Extrusion Closes in on Thin Steel
Sections, by J. H. Rice & L. M.
Christensen, Mar 21 p 71
Extrusion Techniques Close Gap
in Metal Powder Spectrum, June
13 p 131
Mammoth Press Runs Gamut of
Steel Extrusion Jobs, Jan 10 p
56

### F

### **Fabrication**

Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin,

of Ultracold, by U. L. Mar 14 p 81
Designing Sheet Metal Seams, by Federico Strasser, Mar 28 p 86
Explosives Form Without Dies,
Jan 10 p 59
Fabricators Wave Caution Flaz,
by K. W. Bennett, June 6 p 50
Filament Winding Box Shapes,

by K. W. Bennett, June b p as Filament Winding 'Box' Shapes, Apr 11 p 76
Forming Orders Set Brisk Pace, by R. H. Eshe'man, Feb 7 p 75
'Freezer' Makes Metals Stable, Feb 14 p 89
Granular Metals Raise Speeds in Automatic Overlaying, May 30
p. 126

Automatic Overlaying, May 30 p 126
How Good Is Plastic Tooling?
Feb 21 p 136
How Tooling Holds the Line
Against Short-Run Costs, May
16 p 84
Hydroform Improves Deep Draw,
by R. H. Eshelman, Jan 24 p 58
Low Energy Rate Forming Unit
Cuts Costs for Short Runs, May
2 p 76
Matching Four-Slide Machines to

2 p 76 Matching Four-Slide Machines to the Right Forming Job, Feb 7

the Right Forming Job, Feb 7 p 63 New Lathe Speeds Spin Forming, y R. H. Eshelman, Mar 14 p 71 New Tooling Halves Setup Time, May 23 p 75 Stamping Huge Shapes to Size, by Frederico Strasser, Mar 7 p 136 Three Ways to Form Cylinders From Sheet Metal Stack, Feb 14 p 89

p 89
Tomorrow's Tooling: Lessons from
Space, by R. H. Eshelman, Apr
18 p 101
Tooling Up for a Moon Shot, by
R. H. Eshelman, Apr 4 p 67
Transfer Line Speeds Output of
Complex Aluminum Parts, Mar

21 p 76 Vertical Mill Forms Huge Rings, June 6 p 79 Welder Rides 'Roller Skate', Mar 14 p 89

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Fairbanks, Morse & Co.:

Scales Tip '62 Record, Mar 14 p

### The Falk Corp.:

How to Predict Gear Life, by E. J. Wellauer, May 9 p 139

### Farm Equipment, See Machinery, Agricultural

Autos Nudge Nuts, Bolts to '62 Record, by T. M. Rohan, Feb 21

Automated Short-Run Lines, Feb 14 p 84 Titanium Bolts Reach New High, May 16 p 94 Treated Bolt Resists Loosening, Apr 25 p 134

### Ferro Corp.:

Filament Winding 'Box' Shapes, Apr 11 p 76

### Film

Tape Control Stars in Air Force Film, by R. H. Eshelman, Apr 11 p 53

### Finance

How Credit Will React in 1963.

How Credit Will React in 1963.
Jan 3 p 105
How Much Lift From Deficits?
Mar 28 p 55
Industrial Loans Ease Cash Pinch,
by K. W. Bennett, Jan 10 p 30
Profit Lag Mars Press Sales, by
K. W. Bennett, Mar 7 p 99
Profits Plague Appliance Men, by
T. M. Rohan, Mar 14 p 58
Push New Products Hard, Fast,
Profit Life Span Shortens, by
G. J. McManus, Feb 28 p 46
Steel's First Earnings Anemic,
Present Pace Unrealistic, by G.
J. McManus, May 9 p 101
Steel Profits Dropped 16 Pct, But
Depreciation Rose in '62, by G.
J. McManus, Mar 28 p 57
Stopping Gold Loss: Why Not
Start From the Beginning? By
E. C. Beaudet, May 30 p 176
What Controls Dividend Size? Feb
14 p 59

### A. Finkl & Sons Co.:

Shop Dials for Uniform Forgings, by C. L. Kobrin, Mar 28 p 81

### Flame Cutting

New Gas Speeds Flame Cutting, Apr 11 p 72

### Ford Motor Co.:

Ford Backtracks for Ideas, by H. F. Jones, Mar 28 p 67 Hydroform Improves Deep Draw, by R. H. Eshelman, Jan 24 p 58 Magnets Control Weld Pressure

by R. H. Eshelman, Jan 24 p 58
Magnets Control Weld Pressure
For Precision Assembly, by R.
H. Eshelman, June 20 p 94
New Process Plattes Plastics. Apr
11 p 82
New Status. New Uses for Versatile Metal Powders, by C. L.
Kobrin, May 9 p 131
Plastic Panels: Light and Rigid,
June 20 p 96
Transfer Machine Flexibility Grows,
by R. H. Eshelman, May 9 p 117
Turbine Meets Military Needs, by
H. F. Jones, Mar 14 p 67

### Forecasting

Big Year in Building Equipment?
By K. W. Bennett, Feb 28 p 41
Cutting Tool Orders Move Up, by
R. H. Eshelman, May 2 p 53
Fabricators Wave Caution Flag, by
K. W. Bennett, June 6 p 50
Farm Tool Sales Forecasts Rise,
Apr 4 p 55

K. W. Dens.
Farm Tool Sales Forecas...
Apr 4 p 55
Farwest Economy View Good, by
R. R. Kay, May 2 p 54
Forming Orders Set Brisk Pace,
by R. H. Eshelman, Feb 7 p 75
Machine Tool Orders Ride High,

by R. H. Ferming by R.

Apr 4 p 53 Midyear Metalworking Forecast, June 13 p 119 More Ups Than Downs for '63, by Eugene C. Beaudet, Jan 3 p 93 Orders D'p, But Optimism Stay, by R. H. Eshelman, Mar 7 p 121 Plant Spending Is on the Move, by J. D. Baxter, Mar 7 p 111

Profit Lag Mars Press Sales, by K. W. Bennett, Mar 7 p 99 Record Year for Air Coolers? Feb 21 p 168 64 Farm Tool Sales Take Root, by K. W. Bennett, May 30 p 93 Tool Sales: New Tests Ahead, by R. H. Eshelman, Apr 18 p 87 Rill 33 Auto Sales Top 62? By H. F. Jones, Jan 3 p 107

### Foreign Trade

Antitrusters Aim New Actions at Mergers and Foreign Ties, by R. W. Crosby, Jan 10 p 28 Canada's Discriminatory Taxes Hit U. S. Industry Hard, June 27 p 46 Can Quality Offset Low Bidding? Jan 10 p 86 Charge Japanese Dump Hot-Rolled Steel, Feb 14 p 55 Chrysler Hunts Markets Abroad, by H. F. Jones, Apr 25 p 103 Cutting Tool Orders Move Up, by R. H. Eshelman, May 2 p 53 Differing Standards Hamper Exports, Feb 28 p 42 Dumping Complaint Cases Soar, by R. W. Crosby, May 9 p 106 Europe No Threat, Stampers Told, by T. M. Rohan, Mar 28 p 47 Expert Views Foreign Tool Market by R. H. Eshelman, Jan 10 p 41

reign Cars Tailored to Fit U. S.

p 41
Foreign Cars Tailored to Fit U. S.
Market, Apr 25 p 97
Foreign Tool Orders Add to April
Gains, by R. H. Eshelman, May
30 p 107
Forming Orders Set Brisk Pace,
by R. H. Eshelman, Feb 7 p 75
Germany Lures U. S. to a Fair,
May 23 p 40
How to Avoid Pitfalls in Marketing Abroad, by K. W. Bennett,
Mar 14 p 59
Imports Plague Farwest Mills, by
R. R. Kay, Mar 14 p 69
Italy's Ripe for Automation, by
R. M. Bednar, Feb 28 p 45
Latin Market Ripe for Presses, by
R. H. Eshelman, Feb 21 p 123
More World Managers Needed, Feb
7 p 67
New Ruy, American', Policy, Due

7 p 67 New 'Buy American' Policy Due Soon, by R. W. Crosby, May 30

Soon, by R. W. Crosby, May 30 p 95
New VW Aims at Inroads Here, by H. F. Jones, May 2 p 51
One-Stop Shopping for Materials, by K. W. Bennett, Apr 4 p 56
Fig Iron Wages War With Imports, Scrap, by T. M. Rohan, June 13 p 100
Shake Off Global Market Jitters, May 29 p. 51

June 13 p 100
Shake Off Global Market Jitters,
May 23 p 51
Steel Gets Support on Dumping,
by R. W. Crosby, May 16 p 57
Steel Imports Crowd Farwest, by
R. R. Kay, May 9 p 116
Storm Flags Fly at Trade Fair, by
K. W. Bennett, June 27 p 48
Three Up, Three Down in First
Tariff Tests, by R. W. Crosby,
Mar 21 p 48
West German Dumping Defense
Draws Rebuttal by U. S. Mills,
by Werner Zwick & G. J. McManus, Mar 14 p 51
Wheels in Motion to Curb Steel
Dumping, Apr 11 p 41
Wire Red Producers Lose Dumpint Battle, June 27 p 45
Work Out Modern Approach, May
23 p 51

### Forging

Cast Slugs Expedite Forging, Jan 31 p 56
ECM Zeros- In on Heavy Jobs, by C. L. Kobrin, Jan 17 p 95
Forge Shop Gets Quality Hike, Feb 21 p 138
Shop Dials for Uniform Forgings, by C. L. Kobrin, Mar 28 p 81
Spinning Die Forges Billets, Feb 7 p 96

7 p 96 fts Come Out Straight Thin Shafts Come Out Straight After Precision Heat Treat, by R. H. Eshelman, Mar 28 p 88 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

### Formative Products, Inc.

How Good Is Plastic Tooling? Feb

## Foundry

Clean Room Improves Castings, June 27 p 83 New Technology Key to Casting Growth, by C. L. Kobrin, May 16 p 56 Portable Crucible Heats Itself, June 20 p 93 Pushbutton Foundry Pours Brass, Apr 4 p 91

### See also Castings, etc.

### Franklin Institute:

Bearing System Refines Rolling, May 9 p 144

### Freight

Air Freight Clear for Takeoff, by R. R. Kay, Apr 18 p 88 Congress Prods FMC on Steel Trade Rate, June 27 p 51 GSA Aluminum Bids Raise Ship-ping Point, by F. J. Starin, June 20 p 55 Ore Carriers Battle on Lakes With Dimes, by T. M. Rohan, June 20 p 57 Unit Freight Method Picks Up

20 p 57 Unit Freight Method Picks Up Speed, by K. W. Bennett, June 6 p 48

### Frisch Corp.:

Gas Dryer Yields Brighter Steel, Mar 7 p 142

### Fruehauf Trailer Co.:

User Develops Own Aluminum Sources, Mar 7 p 103

Is the Turbine Just a Gimmick or the Next Auto Power Plant? By H. F. Jones, May 23 p 33 L-P Gas Sales Rise at 4 Pct An-nual Rate, May 16 p 59

### Fuken Industrial Co. Ltd.:

Heat-Proof Paints Save Molds, Feb 28 p 77

urnaces

Borings Make Quality Castings,
Jan 31 p 60
Forge Shop Gets Quality Hike,
Feb 21 p 138
Furnace Upgrades to Meet Design Challenge, by
J. E. Miller, Mar 14 p 92
Portable Crucible Heats Itself,
June 20 p 93
Pushbutton Foundry Pours Brass,
Apr 4 p 91

### Furnaces, Electric

Furnace Heaters Form Walls, Apr 11 p 74 Heat-Proof Paints Save Molds, Feb 28 p 77

### Furnaces, Heat Treating

Gas Dryer Yields Brighter Steel, Mar 7 p 142 Heat Treating by Modules, Apr 4

p 96 Palladium Keeps Hydrogen Pure for Bright Annealing Lines, Feb nplate Gets 'Instant' Anneal, Apr 25 p 129

### See also Heat Treating

Furnaces, Oxygen
Mill Suppliers Rise to Meet the
Revolution in Steelmaking, by
G. J. McManus, June 6 p 43

### Furnaces, Vacuum

Arc Melting Upgrades Mill, Mar Arc Melting Upgrades Mill, Mar 28 p 91 Defense Spurs Vacuum Treating by G. J. McManus, Jan 31 p 31 New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131 New Vanadium Furnace Features High Vacuum, May 9 p 109

## See also Vacuum Technology

### G

### Gages, See Electronics Devices & Controls: Instruments

### Gardner-Denver Co.:

Studs Welded Without Spatter, Mar 21 p 81

L-P Gas Sales Rise at 4 Pct Annual Rate, May 16 p 59 Natural Gas Aids Ironmaking, Mar 28 p 94 New Gas Speeds Flame Cutting, Apr 11 p 72

### Gears

Buying Divorced from Expediting, June 27 p 107 Drive Systems Demands Climbs, Apr 25 p 165 How to Predict Gear Life, by E. J. Wellauer, May 9 p 139 Nylon Cast Into Big Gears, by Ralph James, Feb 1 p 92 Tighter Gear Standards Coming, May 23 p 70

### General Dynamics Corp.:

Handle All Changes With Care, Mar 7 p 109 Machining René 41 With Heavy Cuts, Feb 14 p 88

### General Electric Co.:

Advanced Planning Charts Path to New Market, and Profits, by John L. Galt, May 16 p 70 Automate Upkeep, Feb 7 p 59 Can 'Boulwareism' Survive Its Hardes: Test? By J. J. McCaf-ferty, June 27 p 62 Controls Prevent Die Damage, Apr 18 p 114

ferty, June 27 p 62
Controls Prevent Die Damage,
Apr 18 p 114
Controls. The Vital Link to Productivity, by W. N. Redstreake,
June 20 p 83
Cyclie Strain Hardens Ceramics,
Apr 11 p 79
Dense Ceramic Takes High Heat,
Mar 14 p 91
Engineers Go Back to College, by
J. D. Baxter, Feb 21 p 108
Numerical Control Tools Poised
for a Big Jump in Numbers, by
R. H. Eshelman, Jan 31 p 25
Refractory Metals Gain New
Status, by T. M. Roban, May 9
p 107
Welding Reacts to New Demands,
by R. R. Irving, Apr 4 p 83

### General Magnaplate Corp.:

Lubricant Resists Thermal Shock, by C. P. Covino, May 16 p 86

### General Motors Corp.:

General Motors Corp.:

Best Seller: Chevy by a Mile, by H. F. Jones, Jan 17 p 81.

Engineers Call Halt to Rejects, by J. E. Sandford, Feb 21 p 131.

GM to Push Chevy Sales in 1964. by H. F. Jones, June 6 p 57.

New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53.

New Gas Speeds Flame Cutting. Apr 11 p 72.

Rails Mechanize Machine Tools in a Load-Unload Network, by R. H. Eshelman, May 16 p 81.

Tape Simulates Engine Runs, by R. H. Eshelman, Feb 7 p 90.

Thin Shafts Come Out Straight After Precision Heat Treat, by R. H. Eshelman, Mar 28 p 88.

Transfer Line Moves Crankshafts

Through Fast Grinding Cycle, Feb 14 p 82.

Transfer Line Speeds Output of Complex Aluminum Parts, Mar 21 p 76.

### Germany

Germany Lures U. S. to a Fair. May 23 p 40 Labor Rumbles Along the Rhine, by W. Zwick, May 9 p 104 West German Dumping Defense Draws Rebuttal by U. S. Mills, by Werner Zwock & G. J., Me-Manus, Mar 14 p 51

### Gideon, Maj. Gen. C. F .:

Drive to Improve Defense Buying Advances Into New Stage, by P. J. Cathey, Feb 14 p 60

Light Locked in Glass Fibers Finds Hard-to-Reach Flaws, by P. C. Chapin, Jan 17 p 105

### Gilson, Dr. Thomas Q.:

"Action Training" Develops Top-Flight Management—Fast, Apr 18 p 92

### Gold

Industry Puts Gold to Work, Jan 10 p 27 Process Salvages Gold on Plated Parts, May 30 p 132

### Goldsworthy Engineering, See Ferro Corp.

### Government

Antitrusters Aim New Actions at Mergers and Foreign Ties, by R. W. Crosby, Jan 10 p 28
FTC Survey Is Toned Down, But it Still Seeks Company Secrets, by R. W. Crosby, June 13 p 99
How Much Lift From Deficits?
Mar 28 p 55
Industry Chided for R & D Lag, by R. W. Crosby, Feb 21 p 110
Metals Industry Braces for New Antitrust Assault from U. S., by R. W. Crosby, Apr 11 p 37
Must Business Yield More Competitive Data? By Eugene C. Beaudet, June 13 p 198
New Program Off to Bumpy Start, by J. J. McCafferty, Feb 14 p 54
State Capitals Awake to Problems of Industry, June 6 p 62
Youth and Ideals: Business Has Plenty to Offer, Too! By E. C. Beaudet, Jure 6 p 128
Washington, by R. W. Crosby, p 11 all issues

### See also Defense; Legislation; Purchasing, Government

## Gregory Industries, Inc.:

Studs Welded Without Spatter, Mar 21 p 81

### Griffin Wheel, See Amsted Industries. Inc.

### Grinding

Bar Cuts Hard-Surfaced Parts, Feb 21 p 139
Definite Upswing for Abrasive Grinding, by K. W. Bennett, May 9 p 105
Grinding Takes on Superalloys With New Ultrasonic Assist. by J. E. Sandford, Apr 25 p 121
The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28
Transfer Line Moves Crankshafts Through Fast Grinding Cycle, Feb 14 p 82

### Gruman Aircraft Engineering Co.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Growth, see Industrial Expansion

### Gulf States Tube Corp.:

Extruder Turns Out 85-ft Tubes, May 2 p 74

### H

### Hallicrafters Co.:

PA Liaison Spins Cost-Saving Web, June 6 p 119

### Handy & Harman:

Low-Cost Honeycomb Makes Bid as Structural Metal Panel, Feb 21 p 134

### Harnischfeger Corp.:

Big Year in Building Equipment? By K. W. Bennett, Feb 28 p 41

### H. M. Harper Co.:

Merger Trail Can Be Fast Path to Growth, But It Takes Care, by K. W. Bennett, Feb 7 p 68

## Horris Mfg. Co.:

'Freezer' Makes Metals Stable, Feb 14 p 89

### Harvey Aluminum Sales Corp.:

Aluminum Paces Speed Classic, by R. R. Kay, Feb 21 p 121

### Haveg Industries, Inc.:

Fluorocarbon Parts Get Bigger, May 23 p 78

Hawaiians Eye Business Boom, by R. R. Kay, Feb 14 p 67

### Health

Safeguard Executive Health, June 13 p 117

### Heat Treating

Furnace Heaters Form Walls, Apr 11 p 74

The Tall of the Ta

Heat Treating by Modules, Apr 4 p 96 Line Anneals and Cleans Strip, June 13 p 141 Palladium Keeps Hydrogen Pure for Bright Annealing Lines, Feb 21 p 140 Prehardening Boosts Wear Life, May 16 p 92 Stainless Alloy Takes New Form, Mar 21 p 74 Steel Bars Climb to 400,000 Psi. by C. L. Kobrin, Feb 7 p 85 Thin Shafts Come Out Straight After Precision Heat Treat, by R. H. Eshelman, Mar 28 p 88 Tinplate Gets 'Instant' Anneal, Apr 25 p 129

### Hercules Aircraft Industries:

Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

### Hercules Powder Corp.:

Lab-to-Shop Technology Gains, by C. L. Kobrin, Apr 18 p 78

### Hevi-Duty Heating Equipment Co.:

Borings Make Quality Castings, Jan 31 p 60

### Hexcel Products, Inc.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Hobart Brothers Co.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83 Which Process Should You Use for Automatic Welding? By H. B. Cary, Jan 17 p 102

### Hoeganaes Sponge Iron Corp.:

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

### Hollomon, Dr. J. Herbert:

Missiles Get the Billions as Civil-ian R&D Lags, May 2 p 58

## Homestake Mining Co.:

Industry Puts Gold to Work, Jan 10 p 27

### Hoskins Mfg. Co.:

Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

## Howe Sound Co.:

Acid Line Cleans Various Gages, Jan 24 p 63

### Hudelson Sales Co.:

Car Carries Its Own Camper Unit, by H. F. Jones, Apr 11 p 51

### Hughes Aircraft Co.:

Computer Plots Cutting Logic, by T. B. Mealy, Apr 18 p 112

## Hunter Engineering Co.:

User Develops Own Aluminum Sources, Mar 7 p 103

## Huntingdon Alloy Products Div., See International Nickel Co.,

### Huyck Metals:

Fiber Metals: A New Adventure in Engineering Materials, by C. L. Kobrin, Jan 24 p 53

### Hyatt Bearings, Div. See General Motors Corp.

### Hydrogen

Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr 18 p 76

## Ilikon Corp.:

Aluminum 'Bubbles' Over Can Market, by F. J. Starin, Jan 17

p 69 New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

## Imperial Tobacco Co. of Canada:

Bar Cuta Hard-Surfaced Parts, Feb 21 p 139

## Import, See Foreign Trade

Mill for India: How Not to Sell Free Enterprise, by E. C. Beau-det, May 23 p 108

### Industrial Expansion

Advanced Planning Charts Path
to New Markets and Profits, by
John L. Galt, May 16 p 70
Aerospace Profits Soar Upwards,
by R. R. Kay, Apr 4 p 68
Alloy Steels Ride Growth Curve,
by G. J. McManus, Feb 21 p 106
Anaconda Mulls Big Chilean Investment, Feb 14 p 120
Boom Auto Sales Stir Detroit, by
H. F. Jones, Apr 11 p 40
Computers: Mature, But Growing,
by K. W. Bennett, May 23 p 36
Cultivate a Market; Harvest II,
by G. J. McManus, June 13 p
103
103
105

ny t. J. McManus, June 13 p Does Industry Lag? If So, Why? By R. W. Crosby, Feb 7 p 58 Farwest Set to Lure Industry, by R. R. Kay, Feb 28 p 57 Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr 18 p 76 Hawaiians Eye Business Boom, by R. R. Kay, Feb 14 p 67 J & L. Tosses Hat in Trim Ring, by H. F. Jones, Apr 18 p 85 Manufacturing Push Pays Off, by R. R. Kay, June 6 p 58 Measure Capital Spending, Apr 11 p 55

Merger Trail Can Be Fast Path
to Growth, But It Takes Care,
by K. W. Bennett, Feb 7 p 68
Midyear Metalworking Forecast,
June 13 p 119
More Ups Than Downs for '63, by
Eugene C. Beaudet, Jan 3 p 93
New Product Success Built on Old
Know-How, by T. M. Rohan,
May 9 p 120
New Program Off to Bumpy Start,

May 9 p 120

New Program Off to Bumpy Start, by J. J. McCafferty, Feb 14 p 54

PAs Hold Key to Industry Growth, June 20 p 135

PG & E Facilities Will Be Trebled by 1980, Mar 14 p 69

Plant Spending Is on the Move, by J. D. Baxter, Mar 7 p 111

Rubber Closes Record Year; Hunts New Uses, New Markets, by T. M. Rohan, Jan 17 p 63

Scales Tip '62 Record, Mar 14 p 130

State Capitals Awake to Problems of Industry, June 6 p 62
Steel Is Victim—Not Villain, by R. W. Crosby, May 9 p 108
Steel Ready to Charge Problems, by T. M. Roma-, Jan 31 p 28
Tool Spending by Automakers Due for Hike in 1964 Models, by H. F. Jones, Mar 28 p 45
Welding Eves Untapped Markets, by J. J. McCafferty, May 2 p 44

### **Industrial Relations**

Can 'Boulewareism' Survive Its Hardest Test? By J. J. McCaf-ferty, June 27 p.62 Don't Go Overboard on Analysis, Mar 21 p.53 Fear Can Block Communication,

Fear Can Block Communication,
Jan 10 p. 37
Handle All Changes With Care,
Mar 7 p 109
Hoffa Maps Goals for Unions,
Blasts Senile Leaders, by J. J.
McCafferty, Mar 7 p. 97
Industry Drives to Put Realism
Back Into Incentive Programs,
by G. J. McManus, Jan 24 p. 30
'Local' Human Relations Backstops Big Steel's Effort, by J. J.
McCafferty, May 30 p. 91
More Political Action Needed,
June 20 p. 71
Offer Employees a Wage Menu?
By R. R. Kay, Mar 21 p. 67
Put Stockholders to Work, Mar
28 p. 55

28 p 55 Rewards for Special Efforts? Mar 7 p 109 Take Offensive in Bargaining, Apr

4 p 71
What Makes Meetings Succeed?
Apr 18 p 91
What Makes Men Produce, by Dr.
F. J. Gaudet, Jan 3 p 129
Why Are They Restless? Jan 3 p

Youth and Ideals: Business Has Plenty to Offer, Too! By E. C. Beaudet, June 6 p 128

### See also Labor; Management

### Inland Steel Products Co.:

Treatment Helps Paint Adhesion on Two Kinds of Metal Strip, May 23 p 68

Acid Line Cleans Various Gages, Jan 24 p 63 Controls, The Vital Link to Pro-ductivity, by W. N. Redstreake June 20 p 83

June 26 p 83

Dual System Analyzes Metals at
Fast Production Pace, by J. P.
Irwin, May 16 p 90

Europeans Push Automatic Gaging, by R. H. Eshelman, June
6 p 59

Industry Muffles Its Noise, by F. J.
Starin, May 2 p 41

New Unit Detects Trace Metals,
Mar 28 p 90

New Unit Detects Trace Metals, Mar 28 p 90 Plant Spending Is on the Move, by J. D. Baxter, Mar 7 p 111 Sensors Promise to Close Loop on Control of Molten Metal, by W. N. Redstreake, June 27 p 73

### See also Electronic Devices & Controls; Quality Control; Testing & Inspection

### International Business Machines Corp.:

Computer Digests Shop Terms to Work Out Control Tapes, June 6 p.86 Computer Pots Cutting Logic, by T. B. Mealy, Apr 18 p. 112 Computer Ties in Diverse Data, May 2 p.78 How Tooling Holds the Line Against Short-Run Costs, May 16 p. 84

### International Harvester Co.:

Big Year in Building Equipment? By K. W. Bennett, Feb 28 p 41 Front Line Controls Pinpoint Cost Trouble Spots, by W. E. Thomp-son, Apr 25 p 110 New Cameras Chance Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p 56

### International Nickel Co.:

Countdown for Metalworking, by R. R. Kay, Mar 28 p 69 New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131 Palladium Keeps Hydrogen Pure for Bright Annealing Lines, Feb

21 p 140

### international Research & Development Corp.:

'Memory' Table Aids Assembly, May 30 p 133

### Inventories

Are Fence Sitters Set to Jump?
By K. W. Bennett, Jan 10 p 23
Buildup Lags Behind '62 Pace,
May 16 p 53
Farm Tool Sales Forecasts Rise,
Apr 4 p 55
Industrial Detectives Say It Saves
to Pay, by F. J. Starin, Mar 7
p, 100

p 100

p 100 Inventory Problems 'Float' Away, Jan 17 p 132 Users Build 60-Day Steel Supply, Feb 14 p 51

### Ipsen Industries, Inc.:

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kohrin, May 9 p 131

Na'ural Gas Aids Ironmaking, Mar 28 p 94 Pig Iron Wages War With Im-ports, Scrap, by T. M. Rohan, June 13 p 100

### See also, Ore, Ferrous

Italy's Ripe for Automation, by R. M. Bednar, Feb 28 p 45

### James Halcomb Associates

Sli-le Rule Maps Critical Paths, June 13 p 144

### Japan

Can Quality Offset Low Bidding? Jan 10 p 86 Charge Japanese Dump Hot-Rolled Steel, Feb 14 p 55 Heat-Proof Paints Save Molds, Feb 28 p 77

## Jeru, Henri

Furnace Heaters Form Walls, Apr 11 p 74

### Jigs, Fixtures

How Good Is Plastic Tooling? Feb 21 p 136 How Tooling Holds the L Against Short-Run Costs, May

84 s Welded Without Spatter, p 84 Studs Welded Without Spatter, Mar 21 p 81 Welder Rides 'Roller Skate', Mar 14 p 89

### C. E. Johanson Gage Co.:

Precision Levels, by R. H. Eshel-ing, by R. H. Eshelman, June 6 p 59

### Joining

Brazing Tackles New Jobs, by K.
W. Bennett, Feb 7 p 60
Designing Sheet Metal Seams, by
Federico Strasser, Mar 28 p 86
Electroslag Unit Welds Plate, Feb
7 p 98
Magnets Control Weld Pressure
For Precision Assembly, by R.
H. Eshelman, June 20 p 94
Tomorrow's Tooling: Lessons from
Space, by R. H. Eshelman, Apr
18 p 101
Vapors Create Tungsten Joints,
May 23 p 76

### See also Welding & Welding Machines

### Jones & Lamson Machine Co.:

New Tool Lease Plan Is An-nounced, June 20 p 61

### Jones & Laughlin Steel Corp.:

J&L Makes Major Management Changes, May 2 p 45 J & L Tosses Hat in Trim Ring, by H. F. Jones, Apr 18 p 85 Marnets Attract Big Savings, May 9 p 191 Mill Suppliers Rise to Meet the Bayedition in Steelmarking by

Revolution in Steelmaking, G. J. McManus, June 6 p 43 ensors Promise to Close Loop Control of Molten Metal, by N. Redstreake, June 27 p 73

### K

### KSM Products, Inc.:

Timer Controls Weld Energy, Jan

### Kaiser Aluminum & Chemical Corp.:

Aluminum Paces Speed Classic, by R. R. Kay, Feb 21 p 121 Anodic Bath Colors Aluminum Without Using Any Dyes, Mar 28 p 92 'Instant Money' for Vendors, Mar

28 p 94 Vertical Mill Forms Huge Rings, June 6 p 79

### Kaiser Steel Corp.:

Labor Talks Timetable Advanced by Kaiser Payout, Price Hikes, by G. J. McManus, May 2 p 37 Will Steelworkers Try for Indus-try-Wide Kaiser Plan? By G. J. McManus, Feb 14 p 49

### Kantrowitz, Dr. Arthur

access in Research Can't Be Bought, Jan 31 p 38

### Kawecki Chemical Co.:

Extrusion Techniques Close Gap in Metal Powder Spectrum, June 13 p 131

### Kawneer Co.:

Anodic Bath Colors Aluminum Without Using Any Dyes, Mar 28 p 92

### Kearney & Trecker:

Computer Digests Shop Terms to Work Out Control Tapes, June 6 p 86

### Kemwell Ltd.:

Portable Crucible Heats Iself, June 20 p 93

### Koehring Co.:

Big Year in Building Equipment? By K. W. Bennett, Feb 28 p 41

### Koppers Co.:

Continuous Casting Takes Off, by G. J. McManus, Mar 21 p 46 Geiger Tube Paces Continuous Casting, June 6 p 85 Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43 New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53

### Korhumel Steel & Aluminum Co.:

Gas Dryer Yields Brighter Steel, Mar 7 p 142

### L

### Labor

Automation Job Fund Pays Off.
by R. R. Kay, June 27 p 58
Can New Taft-Hartley Labor
Panel Work? By R. W. Crosby,
June 6 p 45
Costly Dock Strike Paralysis
Spreads, by J. J. McCafferty,
Jan 24 p 32
'Early Warning System': Can It
Help Cure Labor's Ills? By J. J.
McCafferty, Mar 21 p 43
Have Steel Wave Talks Started?
By G. J. McManus, Jan 17 p 67
Hoffa Maps Go. s for Unions,
Blasts Senile Leaders, by J. J.
McCafferty, Mar 7 p 97
Labor Talks Timetable Advanced
by Kaiser Payout, Price Hikes,
by G. J. McManus, May 2 p 37
The New Blue Col'ar Worker, by
Lloyd Haney, Jan 3 p 142
Showdown Nearing for Steel
Labor? By G. J. McManus, May
23 p 39
Soft Coal's Soft Sell in Labor, by
G. J. McManus, May 16 p 54
Steel Labor Outlook Is Fluid,
G. J. McManus, May 16 p 54
Steel Laders Avoid Rocking Labor
Boat, by R. D. Raddant, May
30 p 96
Steel Leaders Avoid Rocking Labor
Boat, by R. D. Raddant, May
30 p 96

Steel Leaders Avoid Rocking Labor Boat, by R. D. Raddant, May 30 p. 96 Steel Pact Is Triumph For Human Relations Bargaining, by G. J. McManus, June 27 p. 43 Steel Pact Likely Without Reopen-ing, by G. J. McManus, June 13 p. 101

13 p 101 Uncertainty Grips Steel Labor, by G. J. McManus, Apr 11 p 39 Unions Can Lose, by Dr. Robert McMurry, Jan 3 p 149

UAW Stiffens White Collar Push. Lebanon Steel Foundry by H. F. Jones, May 23 p 38 URW Readies New Contract De-mands, by T. M. Rohan, Feb 7

Weck of Decision in Steel Labor, by R. D. Raddant, May 9 p 102 Why Automakers OK UAW Study Plan, by H. F. Jones, Apr 25 p

Why Office Workers Organize, by Clark Caskey, Jan 3 p 139
 Will Congress Put New Curbs on Growing Union Power? By R. W. Crosby, Feb 21 p 103

### See also Industrial Relations

### Labor, Productivity

Controls, The Vital Link to Pro-ductivity, by W. N. Redstreake, June 20 p. 83

June 20 p 83
Is U. S. Bebind in R & D Race?
By R. H. Eshelman, Mar 21 p 63
Will Steelworkers Try for Industry-Wide Kaiser Plan? By G. J.
McManus, Feb 14 p 49

### Labor, Wages

Fly in the Walsh-Healey Ointment, by J. J. McCafferty, Apr 25 p 92
Labor Rumbles Along the Rhine, by W. Zwick, May 9 p 104
A New Set of Issues in Labor Bargaining, Jan 17 p 76
Offer Employees a Wage Menu?
By R. Kay, Mar 21 p 61
Restraint: Will All Sides Use the New Password? By E. C. Beaudet, Apr 25 p 174
Will Congress Set Fringe Benefits, Too? By E. C. Beaudet, Apr 11 p 120

### Labor Laws

McClellan Rekindles Union Anti-trust Fire, by R. W. Crosby, Jan 17 p 66 Right-toWork Forces Battle Union Shop, by R. W. Crosby, May 2 p 43

Will Congress Set Fringe Benefits, Too? By E. C. Beaudet, Apr 11 p 120

### F. Jos. Lamb Co.:

Rails Mechanize Machine Tools in a Load-Unload Network, by R. H. Eshelman, May 16 p 81

### Lancashire Dynamo Electronic Products, Ltd.

Shop Dials for Uniform Forgings, by C. L. Kobrin, Mar 28 p 81

### Landis Tool Co.:

Transfer Line Moves Crankshafts Through Fast Grinding Cycle, Feb 14 p 82

### LaSalle Steel Co.:

Steel Gets Fast Shave and Draw in New Finishing Process, May 30 p 130

### Latin America

Anti-Americanism: Fact. Fiction or Symbol? Mar 21 p 5
Arzentina's Mood: Hope Mixed With Gloom, Mar 28 p 5
Land of Hope—in Need of Help. by Tom Campbell, Apr 4 p 59
Latin Market Ripe for Presses, by R. H. Eshelman, Feb 21 p 123
A Model for Latin America, by Tom Campbell, Apr 11 p 42
A Time to Watch and Wait, by Tom Campbell, Mar 28 p 48
Youthful Democracy Faces Its Sternest Tests, by Tom Campbell, Mar 21 p 54

Lead R&D Grows Product Crop, by F. J. Starin, June 27 p 50

Switch to Pressure Pouring Up-grades Sand Castings, by C. L. Kobrin, May 30 p 125

### Lectromelt Furnace Div., See Mc-Graw-Edison Co.

### Leeds & Northrup Co.:

Continuous Testing Coming for Steel? By J. J. McCafferty, Apr

Steel? By J. 2.

Steel? By J. 2.

Controls, The Vital Link to Productivity, by W. N. Redstreake.

June 29 p. 83

Control of Molten Metal, by W. N. Redstreake, June 27 p. 73

### Legislation

Congress Sharpens Budget Knife, by R. W. Crosby, Jan 24 p 28 Dumping Comp'aint Cases Sear. by R. W. Crosby, May 9 p 106 Early Warning System': Can It Help Cure Labor's Ills? By J. J. McCafferty, Mar 21 p 43 FTC Survey Is Toned Down, But It Still Seeks Company Secrets, by R. W. Crosby, June 13 p 99 Hoffa Maps Goals for Unions. B'asts Senile Lenders, by J. J. McCafferty, Mar 7 p 97 Hornet's Nest Awaits Congress, by R. W. Crosby, Jan 3 p 97 Industries Line Up for Price Probers, by R. W. Crosby, Jan 3 p 97 Industries Line Up for Price Probers, by R. W. Crosby, May 23 p 35 JFK to Congress; Cut Taxes or Risk Slump, Jan 24 p 29 McClellan Rekindles Union Antitust Fire, by R. W. Crosby, Jan 17 p 66 Path Through Price Law Jungle Is Narrow, Trap-Loaded, May 23 p 53 President Maps Tax Cut Route, by

Path Through Price Law Jungle Is Narrow, Trap-Loaded, May 23 p 53 President Maps Tax Cut Route, by R. W. Crosby, Jan 17 p 65 Pressures Mounting to Force New Look in Antitrust, by J. D. Baxter, Mar 14 p 54 Price Hearines Move in Circles, by R. W. Crosby, May 2 p 39 Price Is 'Weapon', House Told, by R. W. Crosby, June 20 p 60 Reform Program Hits Congressional Snac, by R. W. Crosby, Jan 31 p 27 Steel Gets Support on Dumping, by R. W. Crosby, May 16 p 57 Tax Cuts, Yes Reforms, No, by R. W. Crosby, Feb 14 p 53 Three Up, Three Down in First Tariff Tests, by R. W. Crosby, Mar 21 p 48 Will Congress Put New Curbs on Growing Union Power? By R. W. Crosby, Feb 21 p 163

### Leico Machinery Co.:

New Lathe Speeds Spin Forming, by R. H. Eshelman, Mar 14 p 71

### LeMaire Machine Tool Co.:

Versatility Meets a Challenge, R. H. Eshelman, Jan 31 p 45

## Lenox Instrument Co.:

TV Finds Flaws Inside Tubing, by A. W. Young, June 27 p 76

## Lighting Equipment:

New Lathe Speeds Spin Forming, by R. H. Eshelman, Mar 14 p 71

### The Lincoln Electric Co.:

Weld Cleaning Time Tumbles, Apr 11 p 78 Welding Eyes Untapped Markets, by J. J. McCafferty, May 2 p 44 Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Linde Co. Div., See Union Carbide Corp.

### Link-Belt Co.:

Mill Speeds Scrap Processing, Feb 28 p 82

### Arthur D. Little, Inc.:

Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81

### Lockheed Aircraft Corp.:

Shot Peening Contours Panels, Mar 14 p 94

### Lodge & Shipley Co.:

Lathe 'Tailored' by Tape Rais Precision Levels, by R. Eshelman, Apr 25 p 126

### Loewi & Co.:

Merger Trail Can Be Fast Path to Growth, But It Takes Care, by K. W. Bennett, Feb 7 p 69

### Loftus Engineering Corp.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

### Lovell Mfg. Co.:

Packaging Line Seals Profits by Automating Short Runs, Feb 7

### Lubrication

Bearing System Refines Rolling,
May 9 p 144
Countdown for Metalworking, by
R. R. Kay, Mar 28 p 69
How to Curb Sliding Friction,
June 13 p 136
Lubricant Resists Thermal Shock,
by C. P. Covino, May 16 p 86
New Status, New Uses for Versatile Metal Powders, by C. L.
Kobrin, May 9 p 131
Steel Gets Fast Shave and Draw
in New Finishing Process, May
30 p 130

## Lukens Steel Co.

Alloy Steels Ride Growth Curve, by G. J. McManus, Feb 21 p 106 Electroslag Unit Welds Plate, Feb

7 p 98 Steel Price-Hike Gathers Momen-tum Under Caution Light, by G. J. McManus, Apr 18 p 71

### M

### Machinability

Drilling Test Points the Way to Stainless Machinability, Jan 24 p 64

p 64
'Freezer' Makes Metals Stable, Feb
14 p 89
Machining René 41 With Heavy
Cuts, Feb 14 p 88
New Insight Into Machinability
Gives Shop Men Simple Index,
by Joseph Datsko & Alexander
Henkin, June 20 p 75

### Machine Tool Industry

Machine Tool Industry

Defense Streamlines Tool Setup, by R. H. Eshelman, Feb 14 p 69
Expert Views World Tool Market, by R. H. Eshelman, Jan 10 p 41
Foreign Tool Orders Add to April Gains, by R. H. Eshelman, May 30 p 107
Forum Trades Tooling Ideas, by R. H. Eshelman, June 20 p 69
Is U. S. Behind in R & D Race?
By R. H. Eshelman, Mar 21 p 63
Italy's Ripe for Automation, by R. M. Bednar, Feb 28 p 75
Machine Tool Orders Ride High, Apr 4 p 55
Orders Dip, But Optimism Stays, by R. H. Eshelman, Mar 7 p 121

Researchers Eye Manufacturing, by R. H. Eshelman, June 13 p. 115

p 115
Space Age Demands New Tools, by R. H. Eshelman, May 16
p 67
Tool Experts Meet, Apr 18 p 132
Tool Industry Off to Good Start, by R. H. Eshelman, Jan 3 p 117
Tool Sales: New Tests Ahead, by R. H. Eshelman, Apr 18 p 87

### Machine Tools

Armours Seeks Broad Use of APT Language, by R. H. Eshelman, May 23 p 49 Computer Digests Shop Terms to Work Out Control Tapes, June

Cutting Costs With Automation, by R. H. Eshelman, Apr 25 p

toonomy Tooling S'ashes Costs, by H. F. Jones, June 20 p 67 dlament Winding 'Box' Shapes,

by H. F. Jones, June 20 p 67.
Filament Winding 'Box' Shapes,
Apr 11 p 76.
More Rapid Auto Style Changes
Keep Toolmakers Busy on '65s,
by H. F. Jones, June 20 p 53.
New Tooling Halves Setup Time,
May 23 p 75.
Numerical Control Tools Poised for
a Bir June in Numbers, by

May 23 p 75
Numerical Control Tools Poised for
a Big Jump in Numbers, by
R. H. Eshelman, Jan 31 p 25
Rails Mechanize Machine Tools in
a Load-Unload Network, by R.
H. Eshelman, May 16 p 81
Researchers to Study Metal Design, Output, by R. H. Eshelman,
June 27 p 59
Tomorrow's Toolings: Lessons from
Space, by R. H. Eshelman, Apr
18 p 101
Tool Spending by Automakers Du
for Hike in 1964 Models, by
H. F. Jones, Mar 28 p 45
Transfer Line Moves Crankshafts
Through Fast Grinding Cycle,
Feb 14 p 82
Transfer Line Speeds Output of
Complex Aluminum Parts, Mar
21 p 76
Versatile Design Spurs Savings,
by R. H. Eshelman, Jan 17 p 85

### See also Automation; Electronic Devices & Controls

### Machine Tools, Boring

Boring Mill Shapes Big Sphere, by R. H. Eshelman, May 30 p 128 Tape Control Pavs Its Way on Large Boring Mill, Apr 11 p 80

### Machine Tools, Contour, Sawing & Filing

Shot Peening Contours Panels, Mar 14 p 94

### Machine Tools, Drilling

N/C Language Uses 'Plain Talk' to Program Turret Drill Jobs, by A. W. Young, Apr 4 p 94 Vorsatility Meets a Challenge, by R. H. Eshelman, Jan 31 p 45

### Machine Tools, Grinding

ECM Zeros-In on Heavy Jobs, by C. L. Kobrin, Jan 17 p 95

### Machine Tools, Lathe

Drill System Keeps Holes True, Mar 21 p 84 Lathe 'Tailored' for Tape Raises Precision Levels, by R. H. Eshel-man, Apr 25 p 126 New Lathe Speeds Spin Forming, by R. H. Eshelman, Mar 14 p 71

### Machinery

Big Year in Building Equipment?
By K. W. Bennett, Feb 28 p 41
Handy Robot Fills Many Jobs.
June 6 p 84
Machine Automates Short Runs,
Jan 17 p 99
Packaging Line Sea's Profits by
Automating Short Runs, Feb 7
p 88
Plant Spending Is on the Move,
by J. D. Baxter, Mar 7 p 111

### Machinery, Agricultural

Farm Tool Sales Frecasts Rise, Apr 4 p 55 '64 Farm Tool Sales Take Root, by K. W. Bennett, May 30 p 93 Farm W.

### Machinery, Presses

Automatic Coil Feeding Setup In-Automatic Coil Feeding Setup In-tegrates Stamping Lines, by R. H. Eshelman, May 2 p 72 Hig Tables Ride N/C "Cushion" for Accurate Positioning, Mar 7 p 140 Controls Prevent Die Damage, Apr 18 o. 144

Controls Prevent Die Damage, Apr 18 p 14 Extruder Turns Out 85-ft Tubes, May 2 p 74 Extrusion Closes in on Thin Steel Sections, by J. H. Rice & L. M. Christensen, Mar 21 p 71 Forming Orders Set Brisk Pace, by R. H. Eshelman, Feb 7 p 75 Hydroform Improves Deep Draw, by R. H. Eshelman, Jan 24 p 58 Latin Market Ripe for Presses, by R. H. Eshelman, Feb 21 p 123 Mammoth Press Runs Gamut of Steel Extrusion Jobs, Jan 10 p 56

Matching Four-Slide Machines to the Right Forming Job, Feb 7

ofit Lag Mars Press Sales, by K. W. Bennett, Mar 7 p 99

### Machinery & Allied Products Institute

ow Much Lift From Deficits? Mar 28 p 55

### Machining

Boring Mill Shapes Big Sphere, by R. H. Eshelman, May 30 p

128
ECM Zeros-In on Heavy Johs, by
C. L. Kobrin, Jan 17 p 95
Filament Winding 'Box' Shapes,

Apr 11 p 76 ow Tooling Holds the Line Against Short-Run Costs, May

Against Agains

Spinning Die Forges Billets, Feb 7 p 96 Tape Control Pavs Its Way on Large Boring Mill, Apr 11 p 80 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101 Transfer Machine Flexibility Grows, by R. H. Eshelman, May 9 p 117

by R. H.

### MacDermid, Inc.:

Process Salvages Gold on Plated Parts, May 30 p 132

### Magnets

Atom Smasher Puts the Squeeze on Metalworking Tolerances, Feb

on Metalworking Tolerances, Feb. 14 p. 79
Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar. 14 p. 81
Magnets Attract Big Cost Savings, May 9 p. 191
Magnets Control Weld Pressure For Precision Assembly, by R. H. Eshelman, June 20 p. 94
Magnet Turns Memory On, Off, Feb. 14 p. 92

### Maintenance

Automate Upkeep, Feb 7 p 59 Controls Prevent Die Damage, Apr 18 p 114

Heat-Proof Paints Save Molds, Feb 28 p 77 How to Predict Gear Life, by E. J. Wellauer, May 9 p 139 Palladium Keeps Hydrogen Pure for Bright Annealing Lines, Feb 21 p 140 Prehardening Boosts Wear Life, May 16 p 92 Weld Cleaning Time Tumbles, Apr 11 p 78

11 p 78

### Management

"Action Training" Develops Top-Flight Managers Fast, Apr 18

p 92
Advanced Planning Charts Path
to New Markets and Profits, by
Joha L. Galt, May 16 p 70
Avoid Static Product Thinking,
Feb 21 p 117
Beating the Information Glut,

Feb 21 p 117

Beating the Information Glut,
May 16 p 69

Billing System Covers 'Extras',
Mar 7 p 139

Can 'Boulwareism' Survive Its
Hardest Test? By J. J. McCafferty, June 27 p 62

Can Leisure Be Overdone? June
27 p 61

Can Leisure
27 p 61
Costs Are Blitzed by Value Analysis, by W. A. Fay, June 13 p 104
Develop Top-Value Supervisors,

sis, by W. A. Fay, June 13 p 104 Develop Top-Value Supervisors, Jan 24 p 39 Do Tough Managers Get Results?

June 13 p 117
rawing Out New Ideas, by H. C.
Reel, Jan 3 p 146
ear Can Block Communication.

Drawing Out New Ideas, or Reel, Jan 3 p 146
Fear Can Block Communication, Jan 10 p 37
FTC Survey Is Toned Down, But It Still Seeks Company Secrets, by R. W. Crosby, June 13 p 99
Front Line Controls Pinpoint Cost Trouble Spots, by W. E. Thompson, Apr 25 p 110
Handle All Changes With Care, Mar 7 p 109
Handle Cost-Cutting Properly, June 6 p 61
Weakness,

andle Costonian June 6 p 61 andling Executive Weakness, Handlin

Jan 10 p 37 ow Much Relocation He'p? Jan

134 p. 39

How to Slash Paperwork Costs, by R. R. Kay, Apr 11 p. 52

Industrial Detectives Say It Saves to Pay, by F. J. Starin, Mar 7 p. 109

Leftustry, Childed for R. & D. Laur, Parkets Children for R. & D. Laur, Parkets Chi

n 100
Industry Chided for R & D Lag, by R W Crosby. Feb 21 p 110
Intellectronics' and Management. by R R Kay, May 30 p 106
Is Neurotic Behavior an Asset? May 16 p 69
Line Managers Play New Planning Role, by Ray H. Bartlett, May 30 p 111
Listen to the Accountant, June 6 p 61

p 61
Management's Forgotten Men, by
George Spatta, Jan 3 p 136
Mersrer Trail Can Be Fast Path
to Growth, But It Takes Care,
by K. W. Bennett, Feb 7 p 68
Middle Managers Won't Fade, Mar

by K. W. Bennett, Feb 7 p 68
Middle Managers Won't Fade, Mar
14 p 65
More World Managers Needed,
Feb 7 p 61
New Product Success Built on Old
Know-How, by T. M. Rohan,
May 9 p 120
Path Through Price Law Jungle
Is Narrow, Trap-Loaded, May
23 p 53
Pressures Mounting to Force New
Look in Antitrust, by J. D.
Baxter, Mar 14 p 54
Programming — New Fail-Proof
Way to Train, by P. J. Cathey,
June 20 p 72
PAs Share in Information Pool,
Feb 28 p 102
The Responsibility for Change, by

Fas Share in Information Pool, Feb 28 p 102

The Responsibility for Change, by Howard Heimbach, Jan 3 p 126

The Right to Manage, by Mulcolm Denise, Jan 3 p 122

Safeguard Executive Health, June 13 p 117

Select New Managers Carefully, May 30 p 109

\$17 Billion R&D Outlay for '63, by K. W. Bennett, Jan 3 p 96

Slide Rule Maps Critical Paths, June 13 p 144

Success in Research Can't Be Boucht, Jan 31 p 38

Take Offensive in Bargaining, Apr 4 p 71

4 p 71
Tame the Information Floodtide,
Apr 11 p 55
Wanted—More Ability to Adapt,
May 9 p 119

Wanted: More Engineer-Leaders, by R. R. Kay, Feb 7 p 73 What Makes Meetings Succeed? Apr 18 p 91 What Makes Men Produce, by Dr. F. J. Gaudet, Jan 3 p 129 Why Are They Restless? Jan 3 r 105

p 105 Why Creative Efforts Bog Down, Feb 14 p 59 Why Small Companies Succeed,

### See also Industrial Relations

### Management Information Center, Inc.:

Take Offensive in Bargaining, Apr

### Management Safeguards, Inc.:

Industrial Detectives Say It Saves to Pay, by F. J. Starin, Mar 7 p 100

### Manganese Steel Forge Co.:

rehardening Boosts Wear Life, May 16 p 92

### Manufacturing & Machining Services Corp.:

Cooperative Acts to Aid PAs, Jan

### Marblette Corp.:

How Good Is Plastic Tooling? Feb 21 p 136

### Maremont Automotive Corp.:

Merger Trail Can Be Fast Path to Growth, But It Takes Care, by K. W. Bennett, Feb 7 p 68

### Marketing

Advanced Planning Charts Path to New Markets and Profits, by John L. Galt. May 16 p 70 Are Fence Sitters Set to Jump? By K. W. Bennett, Jan 10 p 23 Billing Delayed on Tinplate, Feb

28 p 40
Builders Again Led Steel Users,
May 2 p 42
Capital Spending Lag Hits P & C,

Capital Spending Lag Hits P & C, Feb 7 p 120
Distributor Is One-Stop Mart, Apr 18 p 169
Does It Pay to Bid for Every Job?
By R. R. Kay, June 13 p 114
Everyone Backs Up Warranties, by H. F. Jones, Feb 7 p 71
How to Avoid Pitfalls in Marketing Abroad, by K. W. Bennett, Mar 14 p 59
Instant Money' for Vendors, Mar 22 p 116
Location 20 Links SKF, Vendors, Mar 21 p 110
New Technology Key to Casting Growth, by C. L. Kobrin, May 16 p 56

New Technology Key to Casting Growth, by C. L. Kobrin, May 16 p 56.

New Tool Lease Plan 1s Announced, June 20 p 61.

One-Stop Shopping for Materials, by K. W. Bennett. Apr 4 p 56.

Product Managers Push Sales, by T. M. Rohan, Mar 28 p 51.

Pull Marketing Plans Together, Jan 17 p 78.

Push New Products Hard, Fast: Profit Life Span Shortens, by G. J. McManus, Feb 28 p 46.

Rubber Closes Record Year: Hunts New Uses, New Markets, by T. M. Rohan, Jan 17 p 68.

Specials: Profit or Grief? By R. M. Pednar, Jan 17 p 68.

Steel Distribution by Consuming Industries, table, May 2 p 42.

Steelmakers to Push Canned Soft Drinks, Feb 14 p 55.

Tool Sales: New Tests Ahead, by R. H. Eshelman, Apr 18 p 87.

Marquette Div., See Curtiss-Wright Corp.

### Marsteller, Inc.:

Work Out Modern Approach, May

### The Martin Co.:

Explosives Form Without Dies, Jan 10 p 59 Surgical Cleaning Aids Missiles,

Surgical Cleaning Aids Missiles, Feb 28 p 80 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101 Vapors Create Tungsten Joints, May 23 p 76 Walting Engels to New Demands

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Massillon Steel Foundry, Inc.:

Can Quality Offset Low Bidding? Jan 10 p 86

### Material Handling

Arc Melting Upgrades Mill, Mar

Arc Melting Upgrades Mil, Mar 28 p 91 Automate Conveyors for Profit, Jan 24 p 86 Do Special Lift Trucks Pay? By H. J. Hinckner, June 6 p 80 Magnets Attract Big Savings, May

9 p 191
Materials Handling Sales Rise, by
K. W. Bennett, June 13 p 105
'Memory' Table Aids Assembly,

K. W. Bennett, June 13 p 100
'Memory' Table Aids Assembly,
May 30 p 133
Pushbutton Foundry Pours Brass,
Apr 4 p 91
Rails Mechanize Machine Tools in
a Load-Unload Network, by R.
H. Eshelman, May 16 p 81
Transfer Line Moves Crankshafts
Through Fast Grinding Cycle,
Feb 14 p 82

### Materials

Ceramic and Plastic Team Up,
May 30 p 136
Dense Ceramic Takes High Heat,
Mar 14 p 91
Fiber Glass Invades
Market, Apr 18 p 79
Fiber Mat Gets Extra Strength as
Plastic Bonds It in Place, June
27 p 78
Fiber Market

Plastic Bonds It in Place, June 27 p. 78
Fiber Metals: A New Adventure in Engineering Materials, by C. L. Kobrin, Jan 24 p. 53
Materials Battle Grows Hotter, by F. J. Starin, May 30 p. 94
New Contender for Can Market, by K. W. Bennett, May 2 p. 40
Nylon Cast Into Big Gears, by Ralph James, Feb 7 p. 92
Plastic Stays Strong at 750 F. May 16 p. 88
Synthetic Rubber Cures at 70 F. June 27 p. 86
Tooling Up for a Moon Shot, by R. H. Eshelman, Apr 4 p. 67

## McGraw-Edison Co.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

### McKinsey & Co.:

Get the Best From Your Com-puter, Apr 25 p 109

### McMillan Mfg. Co.:

Machine Automates Short Runs, Jan 17 p 99

### Mechanical Technology, Inc.:

How to Curb Sliding Friction, June 13 p 136

## Menco Inc.:

Acid Line Cleans Various Gages, Jan 24 p 63

### Merit Products Corp.:

Line Anneals and Cleans Strip. June 13 p 141

### Mesta Machine Co.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

### M & T Chemicals Inc.:

Foam Halves Packaging Costs, Feb 21 p 144 PAs Are Missing Trade Show Boat, May 30 p 167

### Metal Improvement Co.:

Shot Peening Contours Panels, Mar 14 p 94

### Metallizing

Sealer Extends Rust-Free Life for Metallized Structures, by A. P. Shepard, Apr 11 p 69 Vacuum Metallizing of Plastic Sparks New Product Designs, by L. A. Clement, Feb 14 p 86

### Metallurgy

Cryogenies: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81 Fiber Metals: A New Adventure in Engineering Materials, by C. L. Kobrin, Jan 24 p 53 How to Predict Gear Life, by E. J. Wellauer, May 9 p 139 Sound Reveals Stress Patterns, Jan 31 p 58

### Metalonics Corp., See Kawecki Chemical Co.

### Metalworking Industry

Countdown for Metalworking, by R. R. Kay, Mar 28 p 69
Dumping Complaint Cases Soar, by R. W. Crosby, May 9 p 106
Electronic Advances Unwelled, by F. J. Starin, Apr 4 p 58
Farwest Set to Lure Industry, by R. R. Kay, Feb 28 p 57
Industrial Loans Ease Cash Pitch, by K. W. Bennett, Jan 10 p 30
Industry Fights Off a Freeze, Feb 7 p 55
Manufacturing Push Pays Off, by

Industry Fights Off a Freeze, Feb 7 p 55
Manufacturing Push Pays Off, by R. R. Kay, June 8 p 58
Mass Transit: Growing Market for Old Methods and Materials, by F. J. Starin, May 16 p 51
Metals Industry Braces for New Antitrust Assault from U. S., by R. W. Crosby, Apr 11 p 37
Metalworkers Eye 81 Billion Pie, by R. R. Kay, Jan 17 p 83
Midyear Metalworking Forecast, June 13 p 119
More Ups Than Downs for 63, by Eugene C. Beaudet, Jan 3 p 93
New Status, New Uses for Ver-

by Engene C. Beautet, 34a 5 New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131 Plant Spending Is on the Move, by J. D. Baster, Mar 7 p 111 Researchers to Study Metal De-sign, Output, by R. H. Eshel-man, June 2 p 51 Specials': Profit or Grief? By R. M. Bednar, Jan 17 p 68 Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### See also Patents

### Metco, Inc.:

Powder Reacts to Form Coating, May 2 p 82 Sealer Extends Rust-Free Life for Metallized Structures, by A. P. Shepard, Apr 11 p 69

### Metrology, See Standards

### Mexico

A Model for Latin America, by Tom Campbell, Apr 11 p 42

### Midland-Ross Corp.:

Furnace Upgrades Powder Parts to Meet Design Challenge, by J. E. Miller, Mar 14 p 92 Strip Floats Along Conting Line, by H. H. Colson, Feb 21 p 142

### Midvale-Heppenstall Co.:

ECM Zeros-In on Heavy Jobs, by C. L. Kobrin, Jan 17 p 95

### Milling

Photo-Etch Forms Minute Parts, June 20 p 91

### Thomas Miner Associates:

One-Stop Shopping for Materials, by K. W. Bennett, Apr 4 p 57

### Miniaturization

Photo-Etch Forms Minute Parts, June 20 p 91 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

### Mining Equipment

Studs Welded Without Spatter, Mar 21 p 81

## Minneapolis-Honeywell Regulator

Computers Select Best Controls, Jan 31 p 64 Controls, The Vital Link to Productivity, by W. N. Redstreake, June 20 p 83

## Mitchell-Bentley Corp.:

Europe No Threat, Stampers Told, by T. M. Rohan, Mar 28

### Modernization, See Industrial Expansion

### Molding, Molds

Hext-Proof Paints Save Molds. Feb 28 p 77 Pushbutton Foundry Pours Brass,

Apr 4 p 91
Switch to Pressure Pouring Up-grades Sand Castings, by C. L. Kobrin, May 30 p 125

AMAX to Build Research Center, June 20 p 61 Oxide Film Passes Fiery Tests as Refractory Heat Shield, Mar 21

p 82 Refractory

efractory Metals Gain Ne Status, by T. M. Rohan, May p 107

### Monsanto Chemical Co.:

What Developers Must Learn, Feb. 21 p. 117

### Moore Products Co.:

Controls, The Vital Link to Productivity, by W. N. Redstreake, June 20 p 83
Tiny Jets Replace Moving Parts in Process-Control Devices, by C. L. Mamzic, May 23 p 65

## Mosaic Fabrications, Inc.:

Light Locked in Glass Fibers Finds Hard-to-Reach Flaws, by P. C. Chapin, Jan 17 p 105

## Motivational Programmers, Inc.:

Shake Off Global Market Jitters, May 23 p 51

### Motorola, Inc.:

Finishing Line Goes Continuous With Automatic Vibrator, June 13 p 134

### Multifastener Corp.:

Pierce Nut Simplifies Assembly in Short-Run Lines, Feb 14 p 84

### N

### National Ass'n of Electrical Distributors

. . Guidelines Are Necessary, May 30 p 109

### National Cylinder Gas, See Chemetron, Inc.

### National Electric Welding Machines Co.

Three Ways to Form Cylinders From Sheet Metal Stock, Feb 14 p 89 Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

## National Industrial Conference

Board: How Good Is Company Training? June 27 p 61 How Much Relocation Help? Jan 24 p 39 Measure Capital Spending, Apr 11 p 55

Measure Capital Spending, Apr 11 p 55
Midyear Metalworking Forecast,
June 13 p 119
Plant Spending Is on the Move,
by J. D. Baxter, Mar 7 p 111
Pressures Mounting to Force New
Look in Antirust, by J. D. Baxter, Mar 14 p 54
Product Managers Push Saies, by
T. M. Rohan, Mar 28 p 51
Select New Managers Carefully,
May 30 p 109
What Business Wants Done, June
20 p 71
What Controls Dividend Size? Feh
14 p 59

## National Lead Co.:

Fiber Mat Gets Extra Strength as Plastic Bonds It in Place, June 27 p 78

## National Patent Development Corp.:

Patent Marketers Run Idea Ex-change, by F. J. Starin, Feb 21 p 111

### National Research Corp.:

Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81 New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131 Vacuum Coatings Protect Steel at Temperatures Over 500 F, Jan 24 p 56

### National Steel Corp.:

Continuous Casting Going Ton-nage-Scale, May 16 p 59 Continuous Casting Takes Off, by G. J. McManus, Mar 21 p 46 Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

### National Ultrasonic Corp.:

Ultrasonic Machine Cleans Steel on a Continuous-Strip Basis, by A. W. Young, Apr 18 p 109

### Nelson Stud Welding Div., See Gregory Industries, Inc.

### Netherlands Institute for Industrial Development:

Latin Market Ripe for Presses, by R. H. Eshelman, Feb 21 p 123

'Encouraging Upturn' Seen for '63 Nickel, Mar 14 p 134 Nickel Outlook Good Despite '62 Drop, Jan 3 p 214 Nickel Plate Could Make Cents, by H. F. Jones, June 27 p 57

### Nitriding

Designers Fight Valve Fatigue With Salt Bath Treatment, by D. R. Dorff, Jan 10 p 54

### Nitrogen

Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr 18 p 76

### Nonferrous Metals

Are Price Changes in Lead, Zinc Likely? May 9 p 109 Industry Puts Gold to Work, Jan 10 p 27 Prices Prove Barrier to U. S. Metals Sale, Feb 21 p 172

### See also individual nonferrous metals

### Nonferrous Metals, Bending & Forming

Forming
Aluminum Pellets Form Sheets, by
F. J. Starin, Mar 7 p 102
Explosives Form Without Dies,
Jan 10 p 59
Freezer' Makes Metals Stable, Feb
14 p 89
Photo-Etch Forms Minute Parts,
June 20 p 91
Plasma Arc: A New Approach to
Mechanized Welding, by R. R.
Irving, Jan 10 p 49
Tomorrow's Tooling: Lessons from
Space, by R. H. Eshelman, Apr
18 p 101
Forms Huge Rings,
June 6 p 79

### North American Aviation Corp:

Serb American Aviation Corp:

Electron Beam Tames Production in Portable Welding Chamber, May 2 p 79

Joint Venture, Jan 31 p 44

Lab-to-Shop Technology Gains, by C. L. Kobrin, Apr 18 p 78

Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

Tooling Up for a Moon Shot, by R. H. Eshelman, Apr 4 p 67

Welder Rides 'Roller Skate,' Mar 14 p 89

Welding Reacts to New Demands, by R. Irving, Apr 4 p 83 elding Reacts to New Demands. by R. R. Irving, Apr 4 p 83

## North American Tank Car Corp.:

Fiber Glass Invades Tank Car Market, Apr 18 p 79

## Northern Metal Products Co.:

Europe No Threat, Stampers Told, by T. M. Rohan, Mar 28 p 47

### Northrop Corp.:

Brazing Tackles New Jobs, by K.
W. Bennett, Feb 7 p 60
Extrusion Closes in on Thin Steel
Sections, by J. H. Rice & L. M.
Christensen, Mar 21 p 71
How to Shash Paperwork Costs,
by R. R. Kay, Apr 11 p 52
Tomorrow's Tooling: Lessons from
Space, by R. H. Eshelman, Apr
18 p 101

### Norton Co.:

Coated Abrasives Descale Steel, Apr 25 p 132 Transfer Line Moves Crankshafts Through Fast Grinding Cycle, Feb 14 p 82

### Ordnance

Does Humidity Control Pay for Rust Prevention? June 27 p 80

### See also Defense; Purchasing, Government

### Odiorne, George S.:

Don't Go Overboard on Analysis, Mar 21 p 53

### Ohio Crankshaft Co.:

Thin Shafts Come Out Straight After Precision Heat Treat, by R. H. Eshelman, Mar 28 p 88

### Ohio Products Co.:

Natural Gas Aids Ironmaking, Mar 28 p 94

### Opinion Research Corp.:

Put Stockholders to Work, Mar 28 p 55 Why Not Programmed Training? Jan 31 p 37

### Ore, Beneficiation

Ore Mining Changes Studied, by T. M. Rohan, Jan 3 p 99

### Ore, Ferrous

Ore Carrier Battle on Lakes With Dimes, by T. M. Rohan, June 20

p 57 Ore Mining Changes Studied, by T. M. Rohan, Jan 3 p 99 Tough Ore Market Yields Gains, by T. M. Rohan, Apr 25 p 94

### See also Iron

### Oregon Metallurgical Corp. (Oremet):

Refractory Metals Made Dense Through Centrifugal Casting, Apr 25 p 124

### Osborn Mfg. Co.:

Pushbutton Foundry Pours Brass, Apr 4 p 91

### Owens-Corning Fiberglass Corp.:

Plastics Launch Space Drive, by K. W. Bennett, Feb 14 p 52

### Oxides

Anodic Bath Colors Aluminum Without Using Any Dyes, Mar 24 p 92 Oxide Film Passes Fiery Tests as Refractory Heat Shield, Mar 21

p 82 Rust Converted to Useful Oxides, May 16 p 93

### Oxygen

Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr 18 p 76 How Digital Computer Controls Oxygen Steelmaking Unit, by E. J. Borrebach, Mar 21 p 78 Oxygen Leads Steel Progress, by C. L. Kobrin, Apr 11 p 44

### Packaging

Foam Halves Packaging Costs, Feb 21 p 144 New Contender for Can Market, by K. W. Bennett, May 2 p 40

Packaging Line Seals Profits by Automating Short Runs, Feb 7

p 88 rapping Wraps Up Greater Sales, Feb 7 p 61

### See also Containers

### Paints & Painting

Heat-Proof Paints Save Molds, Feb 28 p 77 Painted Steels Parade Lures Mills to March, by G. J. McManus, May 30 p 98 Sealer Extends Rust-Free Life for

Sealer Extends Rust-Free Life for Metalized Structures, by A. P. Shepard, Apr 11 p 69 Treatment Helps Paint Adhesion on Two Kinds of Metal Strip, May 23 p 68

### See also Cleaning & Finishing

New Contender for Can Market, by K. W. Bennett, May 2 p 40

### Paperwork

How to Slash Paperwork Costs, by R. R. Kay, Apr 11 p 52

### Parsons, Brinckerhoff, Quade & Douglas

ass Transit: Growing Market for Old Methods and Materials, by F. J. Starin, May 16 p 51

### Parsons Corn :

Numerical Control Tools Poised for a Big Jump in Numbers, by R. H. Eshelman, Jan 31 p 25

### Patents

New Patents, Jan 3 p 196; Jan 10 p 72; Jan 17 p 117; Jan 24 p 70; Feb 7 p 100; Feb 18 p 94; Feb 21 p 150; Feb 28 p 92; Mar 7 p 144; Mar 14 p 96; Mar 11 p 88; Apr 18 p 148; Apr 25 p 142; May 2 p 85; May 9 p 166; May 10 p 188; June 6 p 96; June 10 p 188; June 6 p 96; June 20 p 13; June 27 p 88; May 20 p 188; June 20 p 113; June 27 p 88

p 88 Numerical Control Tools Poised for a Big Jump in Numbers, by R. H. Eshelman Jan 31 p 25 Patent Marketers Run Idea Ex-change, by F. J. Starin, Feb 21

change, by F. J. Starin, Feb 21 p 111 atent Rights: What Is Best For the Public? By Eugene C. Beau-det, Apr 18 p 178 . S. to Get Russian Casting Process, June 20 p 56

## Peening

Shot Peening Contours Panels, Mar 14 p 94

### **Pennsylvania**

State Capitals Awake to Problems of Industry, June 6 p 62

### Performance Measurement Co.:

What's Next Automation St. By R. H. Eshelman, Mar p 71 Step?

## Perkin-Elmer Corp.:

New Unit Detects Trace Metals.

### Pesco Products Div., See Borg-Warner Corp.

### The Pfaudler Co.:

Boiler Restores Plating Baths, Feb

### Philadelphia Gear Corp.:

Buying Divorced from Expediting. June 27 p 107 Drive Systems Demand Climbs, Apr 25 p 165

### Philco Corp.:

Continuous Testing Coming for Steel? By J. J. McCafferty, Apr 18 p 75

### Phoenix Steel Corp.:

Alloy Steels Ride Growth Curve, by G. J. McManus, Feb 21 p 106 Heat-Treat Line for Wide Plate Accents 'Specialty' Trend, by C. L. Kobrin, Mar 7 p 131

### Photography

ew Cameras Change Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p 56 hoto-Etch Forms Minute Parts, June 29 p 91

### Pipe, Tubes

Extruder Turns Out 85-ft Tubes,
May 2 p 74
Instant X-Ray Pinpoint Flaws in
Fusion-Welded Pipe, by W. N.
Redstreake, May 2 p 69
New Heating System Boosts Pipe
Market, Jan 17 p 69
Plasma Arc: A New Approach to
Mechanized Welding, by R. R.
Irving, Jan 10 p 49
Service Centers Prove Aid to PA,
May 16 p 125
TV Fir's Flaws Inside Tubing,
by A. W. Young, June 27 p 76
Twin Tests Double-Check Pipe to
Catch Marginal Flaws, by W. A.
Olack, May 9 p 142

### Pittsburgh Plate Glass Co.:

Adhesive Gains Challenge PAs, May 2 p 107 Anodic Bath Colors Aluminum Without Using Any Dyes, Mar 28 p 92

### Pittsburgh Steel Co.:

Computer Ties in Diverse Data,

May 2 p 78
Steel Price-Hike Gathers Momentum Under Caution Light, by G. J. McManus, Apr 18 p 71

### Planning, See Management

### Plant Equipment

Industry Muffles Its Noise, by F. J. Starin, May 2 p 41 Scales Tip '62 Record, Mar 14 p 130

### Plant Layout

Pushbutton Foundry Pours Brass, Apr 4 p 91

### Plant Location

Farwest Set to Lure Industry, by R. R. Kay, Feb 28 p 57

### Plastics

Ceramic and Plastic Team Up,
May 30 p 136
Design Opportunities Widen With
Plastics Materials, June 13 p 138
Fiber Mat Gets Extra Strength as
Plastic Bonds It in Place, June
27 p 98
Filament Winding Box Shapes,
Apr 11 p 76

27 p 98
Filament Winding 'Box' Shapes,
Apr 11 p 76
Fluorocarbon Parts Get Bigger,
May 23 p 78
Foam Halves Packaging Costs,
Feb 21 p 144
How Good Is Plastic Tooling? Feb
21 p 136
Lab-to-Shop Technology Gains, by
C. L. Kobrin, Apr 18 p 78

Materials Battle Grows Hotter, by F. J. Starin, May 30 p 94 New Process Plates Plastics, Apr

New Process Plates Plastics, Apr 11 p 82 Nylon Cast Into Big Gears, by Ralph James, Feb 7 p 92 One-Stop Shopping for Materials, by K. W. Bennett, Apr 4 p 56 Plastic Panels: Light and Rigid, June 29 p 96 Plastics Launch Space Drive, by K. W. Bennett, Feb 14 p 52 Plastic Stays Strong at 750 F. May 16 p 88 Tomorrow's Tooling: Lessons from Space, by R. H. Esbelman, Apr 18 p 101 Vacuum Metallizing of Plastic

18 p 101 Vacuum Metallizing of Plastic Sparks New Product Designs, by L. A. Clement, Feb 14 p 86

### Plates, Sheets, Strip

Acid Line Cleans Various Gages.

Acid Line Cleans Various Gages, Jan 24 p 63 Aluminum Pellets Form Sheets, by F. J. Starin, Mar 7 p 102 Designing Sheet Metal Seams, by Federico Strasser, Mar 28 p 86 Electroslag Unit Welds Plate, Feb

Electrosing Unit Welds Plate, Feb. 7 p 98
Heat-Treat Line for Wide Plate Accents 'Specialty' Trend. by C. L. Kobrin, Mar 7 p 131
J & L. Tosses Hat in Trim Ring, by H. F. Jones, Apr 18 p 85
Line Anneals and Cleans St. p.
June 13 p 141
Stainless Alloy Takes New Form, Mar 21 p 74
Strapping Wraps Up Greater Sales, Feb. 7 p 61
Thin Stainless Drawn Extra Deep, by A. W. Young, Apr 25 p 130
Three Ways to Form Cylinders From Sheet Metal Stock, Feb. 14 p 89
Treatment Helps Paint Adnesion on Two Kinds of Metal Strip, May 23 p 68
Ultrasonic Machine Cleans Steel on a Continuous-Strip Basis, by A. W. Young, Apr 18 p 109

### Polaroid Corp.:

New Cameras Change Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p 56

### Pollution, Air

Car Smog Not Unique to Coast, by R. R. Kay, Jan 24 p 42 Is the Turbine Just a Gimmick or the Next Auto Power Plant? By H. F. Jones, May 23 p 33

### Polymer Corp.:

Ceramic and Plastic Team Up. May 30 p 136 Nylon Cast Into Big Gears, by Ralph James, Feb 7 p 92 Plastics Launch Space Drive, by K. W. Bennett, Feb 14 p 52

## H. K. Porter Co., Inc.:

Continuous Casting Takes Off, by G. J. McManus, Mar 21 p 46 New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53

### Potomac Iron Works, Inc.:

Billing Systems Covers 'Extras', Mar 7 p 139

### Powdered Metals

Extrusion Techniques Close Gap in Metal Powder Spectrum.

Extrusion Techniques Close Gap in Metal Powder Spectrum. June 13 p 131
Furnace Upgrades Powder Parts to Meet Design Challenge, by J. E. Miller, Mar 14 p 92
Lead R&D Grows Product Crop. by F. J. Starin, June 27 p 50
More Uses Predicted for Metal Powders, May 9 p 110
New Status. New Uses for Versatile Metal Powders by C. L. Kobrin, May 9 p 131
Powder Metal Urgy Gets a Boost from New Metals and Controls, Jan 31 p 53
Powder Reacts to Form Coating, May 2 p 82

### Powdered Metals Products Co.:

Furnace Upgrades Powder Parts to Meet Design Challenge, by J. E. Miller, Mar 14 p 92

Detroit Won't Spare the Horses, by H. F. Jones, Jan 3 p 98 Fuel Cells: They're Not Dead! By K. W. Bennett, Apr 18 p 74 Low Energy Rate Forming Unit Curts Costs for Short Runs, May

Cuts Costs for Short Runs, may 2 p 76
Natural Gas Aids Ironmaking,
Mar 28 p 94
PG & Facilities Will Treble by
1980, Mar 14 p 69
Research Betters
Sources, Jan 17 p 70
The Silent Force of Ultrasonics,
by W. N. Redstreake, Feb 28

blid-State Drives Save Space, Jan 31 p 63

### See also Atomic Energy; Coal & Coke; Fuel; Gas

### Pratt & Whitney Corp.:

Numerical Control Tools Poised for a Rig Jump in Numbers, by R. H. Eshelman, Jan 31 p 25

### Precision Welder & Flexograph Corp.:

Magnets Control Weld Pressure For Precision Assembly, by R. H. Eshelman, June 20 p 94

### Premier Steel Mills, Ltd.:

New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53

### Press Automation Industries, Inc.:

Automatic Coil Feeding Setup Integrates Stamping Line, by R. H. Eshelman, May 2 p 72

### Pressed Steel Ltd.:

Automatic Coil Feeding Setup Integrates Stamping Lines, by R. H. Eshelman, May 2 p 72

### Presswork

Automatic Coil Feeding Setup Interrates Stamping Lines, by R. H. Eshelman, May 2 p 72 Europe No Threat, Stampers Told, by T. M. Rohan, Mar 28 p 47

p 47 Stampers Battle Backlog Jam, by K. W. Bennett, Apr 25 p 96 Stamping Huge Shapes to Size, by Federico Strasser, Mar 7 p 136

### H. C. Price Co.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

Billing Delayed on Tinplate, Feb. 28 p. 40
FTC Case Called Test of List-Price Usage, June 20 p. 61:
Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr. 18 p. 76
Industries Line Up for Price Probers, by R. W. Crosby, May 23 p. 35
Is Item Quantity Pricing Back? May 7 p. 180
Labor Talks Timetable Advanced by Kaiser Payout, Price Hikes, by G. J. McManus, May 2 p. 37
Metals Industry Braces for New Antitrust Assault from U. S., by R. W. Crosby, Apr. 11 p. 37
Path Through Price Law Jungle Is Narrow, Trap-Loaded, May 23 p. 53

Price & Production Data, Jan 3 p 157

Price & Production Data, Jan 3 p 157
Price Hearings Move in Circles, by R. W. Crosby, May 2 p 39
Price Hike Lifts Steel Hopes, by G. J. McManus, Apr 25 p 91
Price Is Weapon, House Told, by R. W. Crosby, June 20 p 60
Price Probes: Are They Missing the Point? By E. C. Beaudet, May 2 p 116
Prices: How Much More in '64?
Answer Is in the Marketplace, Apr 25 p 89
Restraint: Will All Sides Use the New Password? By E. C. Beaudet, Apr 25 p 174
Stainless Makers Juggle Prices, by G. J. McManus, Feb 28 p 39
Steel and the Cost of Living, Apr 25 p 179
Steel Price-Hike Drive Gathers Momentum Under Caution Light, by G. J. McManus, Apr 18 p 71
Why Stainless Prices Were Cut.

Light, by to 18 p 71 less Prices Were Cut, by G. J. McManus, Jan 10 p 26 Will Aluminum Hikes Spread? By F. J. Starin, May 9 p 103

### Process Control

Armour Seeks Broad Use of APT Language, by R. H. Eshelman, May 23 p 49 Computer Digests Shop Terms to Work Out Control Tapes, June

Computers: Mature, But Grow-ing, by K. W. Bennett, May 23 p 36

ing, by K. W. Bennett, May 23 p 36
Continuous Testing Coming for Steel? By J. J. McCafferty, Apr 18 p 75
Controls, The Vital Link to Preductivity, by W. N. Redstreake, June 20 p 83
How Digital Computer Controls Oxygen Steelmaking Unit, by E. J. Borrebach, Mar 21 p 78
Sensors Promise to Close Loop on Control of Molten Metal, by W. N. Redstreake, June 27 p 73
Tiny Jets Replace Moving Parts in Process-Control Devices, by C. L. Mamzic, May 23 p 65

### See also Automation; Data Processing; Electronic Devices & Controls

### Production Machinery Corp.:

Tinplate Gets 'Instant' Anneal, Apr 25 p 129

### Programming, See Data Processing; Electronic Devices & Controls

### Pullman, Inc.:

Timer Controls Weld Energy, Jan 24 p 66

### Pumps & Compressors

Capital Spending Lag Hits P & C, Capital Spending Lag Hits F & C, Feb 7 p 120 Profits from Crash Programs, by John Di Stefano, Apr 4 p 72 Shop Dials for Uniform Forgings, by C. L. Kobrin, Mar 28 p 81

## Purchasing

Are You Overlooking Adhesives?
Feb 14 p 116
Billing System Covers 'Extras',
Mar 7 p 139
Buving Divorced from Expediting,
June 27 p 107
Can Quality Offset Low Bidding?
Jan 10 p 86
Costs Are Blitzed by Value Analysis, by W. A. Fay, June 13 p 104
EDP Is a Winner as PA Right
Arm, Apr 11 p 111
'Instant Money' for Vendors, Mar
28 p 116
Is Item Quantity Pricing Back?
Mar 7 p 180
No Longer a 'Necessary Evil'

Mar 7 p 180

No Longer a 'Necessary Evil'
Jan 3 p 210

Pressures Mounting to Force New
Look in Antitrust, by J. D.

Paxter, Mar 14 p 54

PAs Hold Key to Industry Growth, June 20 p 1235 PA Liaison Spins Cost-Saving Web, June 6 p 119 PAs Share in Information Pool, Feb 28 p 102

### Purchasing, Government

Aerospace's Risks Can Hurt, by R. R. Kay, Jan 31 p 44 Cadmium Price Woes Dull Plating Outlook, by F. J. Starin, May 16 p 55

Cooperative Acts to Aid PAs, Jan

Outlook, by F. J. Starin, May 16 p 55
Cooperative Acts to Aid PAs, Jan 31 p 90
Detense Streamlines Tool Setup, by R. H. Eshelman, Feb 14 p 69
Drive to Improve Defense Buying Advances Into New Stage, by P. J. Cathey, Feb 14 p 60
Farwest Economy View Good, by R. R. Kay, May 2 p 54
Fly in the Walsh-Healey Ointment, by J. J. McCafferty, Apr 25 p 92
GSA Aluminum Bids Raise Shipping Points, by F. J. Starin June 20 p 55
How Small Business Views U. S. Contracts, Apr 11 p 46
Metals Industry Braces for New Antitrust Assault from U. S., by R. W. Crosby, Apr 11 p 37
Military Phases-In Supply Network, Apr 18 p 73
Missiles Get the Billions as Civilian R&D Lags, May 2 p 58
New Buy American' Policy Due Soon, by R. W. Crosby, May 30 p 95
Fatent Rights: What Is Best for the Public? By Eugene C. Reaudet, Apr 18 p 178
Pentagon Tightens Contracting Rules, by R. W. Crosby, June 13 p 102
Prices Prove Barrier to U. S. Metals Sale, Feb 21 p 172
Profit Refund Squeeze Coming, by R. W. Crosby, June 20 p 59
Report Attacks Navy Shipbuilding Costs, by R. W. Crosby, Apr 11 p 56
Surplus Stockpile Plan OK'd by President by R. W. Crosby, Apr 11 p 56
Surplus Stockpile Plan OK'd by President by R. W. Crosby Feb.

11 p 55
Surphus Stockpile Plan OK'd by
President, by R. W. Crosby, Feb
28 p 44
U. S. Holds Tungsten Trump, by
F. J. Starin, Feb 28 p 43

### Purolator Products, Inc.:

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

### Quality Control

Clean Room Improves Castings,
June 27 p 83
Engineers Call Halt to Rejects, by
J. E. Sandford, Feb 21 p 131
Powder Metallurgy Gets a Boost
from New Metals and Controls,
Jan 31 p 53
Tester Speeds Hardness Checks,
May 23 p 74
Total Quality is Goal, by K. W.
Bennett May 30 p 97
What's Next Automation Step?
By R. H. Eshelman, Mar 28 p 71

### See also Testing & Inspection

### R

### Radio Corporation of America:

Controls, The Vital Link to Productivity, by W. N. Redstreake, June 20 p 83 Testee Speeds Hardness Checks, Ma, 23 p 74

### Railroad Equipment

Fiber Glass Invades Tank Car Market, Apr 18 p 79 Tane Control Pays Its Way on Large Boring Mill, Apr 11 p 80

### Railroads

Mass Transit: Growing Market for Old Methods and Materials, by F. J. Starin, May 16 p 51 Rails Mechanize Machine Tools in a Lond-Unload Network, by R. H. Eshelman, May 16 p 81 Unit Freight Method Picks Up Speed, by K. W. Bennett, June 6 p 48

Submerged Arc Links Big Rails With Strong, Hard Welds, Mar 7 p 134

### Raytheon Co.:

How to Build Reliability Into Welded Circuits, by C. R. Olsen, June 6 p 82 Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

How Campus Recruiters Work, Apr 18 p 91

### Refractories

Oxide Film Passes Fiery Tests as Refractory Heat Shield, Mar 21

Refractory Heat Shield, Mar 21 p 82 Powder Metallurgy Gets a Boost from New Metals and Controls, Jan 31 p 53 Refractory Metals Gain New Status, by T. M. Rohan, May 9 p 107 Refractory Metals Made Dense Through Centrifugal Casting, Apr 25 p 124

### See also individual Refractories

### Refrigeration

'Freezer' Makes Metals Stable, Feb 14 p 89

### Regina Corp.:

FTC Case Called Test of List-Price Usage, June 20 p 61

Reliance Electric & Engineering Co.: Solid-State Drives Jan 31 p 63

### Renegotiation, See Purchasing, Government

## Rensselaer Polytechnic Institute

Engineers Go Back to College, by J. D. Baxter, Feb 21 p 108 New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

## Republic Steel Corp.:

New Status, New Uses for Versatile Metal Powders, by C. L. Kobrin, May 9 p 131
Republic Goes to Basic Oxygen. Apr 4 p 61
Steel Price-Hike Gathers Momentum Under Caution Light, by G. J. McManus, Apr 18 p 71
Twin Tests Double-Check Pipe to Catch Marcinal Flaws, by W. A. Black, May 9 p 142

### Rovere Camera Co.:

New Cameras Change Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p 56

### Reynolds Metals Co.:

Aluminum Pellets Form Sheets, by F. J. Strain, Mar 7 p 102 Reynolds Halts Production of Cur-tain Walls, Apr 11 p 109 Strip Floats Along Coating Line, by H. H. Colson, Feb 21 p 142

### R&D. See Science & Research

### Rheem Mfg. Co.:

Product Managers Push Sales, by T. M. Rohan, Mar 28 p 51

Adhesive Bonding Plus Riveting Lowers Structural Streves, Jan 17 p 100

### See also Adhesives: Bonding; Joining: Welding & Welding Machines

### Roanoke Electric Steel Corp.:

Roanoke Casting Unit Now Operating, May 16 p 59

### Robertson Photo-Mechanix:

New Cameras Change Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p 56

### Roblin-Seaway Industries, Inc.:

Big Step for Continuous Casting, by G. J. McManus, Jan 24 p 27 Continuous Casting Takes Off, by G. J. McManus, Mar 21 p 46 New Drive Behind Continuous Casting, by G. J. McManus, Mar 14 p 53

### Rohm & Hoos Co :

Vacuum Metallizing of Plastic Sparks New Product Designs, by L. A. Clement, Feb 14 p 86

### Rolling Mills

Arc Melting Upgrades Mill, Mar 28 p 91 Bar Mil's Launch Quality Drive, by T. M. Roban, Jan 10 p 31 Bearing System Refines Rolling, May 9 p 144 Rolls Changed by Push Button, June 13 p 142 User Develops Own Aluminum Sources, Mar 7 p 103

### Ross-Waldron Div., See Midland-Ross Corp.:

### Roto-finish Ransohoff Co.:

Finishing Line Goes Continuous With Automatic Vibrator, June 13 p 134

### Rubber

Rubber Closes Record Year; Hunts New Uses, New Markets, by T. M. Rohan, Jan 17 p 63 Synthetic Rubber Cures at 70 F, June 27 p 86 URW Readies New Contract De-mands, by T. M. Rohan, Feb 7

n 56

## Ruhrstah!-Heraeus:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus. June 6 p 43

### Russia, See U.S.S.R.

### Rus: Engineering Corp.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

### **Rutgers University**

"Action Training" Develops Top-Flight Management—Fast, Apr

### Ryan Industries, Inc.:

Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 n 81

### J. T. Rverson & Sons:

One-Stop Shopping for Materials, by K. W. Bennett, Apr 4 p 56

### 5

### Safety

Future Safety Gains Will Be Hard to Win, Apr 11 p 45 ladustry Muffles Its Noise, by F. J. Starin, May 2 p 41 New Cameras Change Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p 56 New Gas Speeds Flame Cutting, Apr 11 p 72 Studs Welded Without Spatter, Mar 21 p 81

## St. Joseph Lead Co.:

Commercial Zinc Extruding Nears, by F. J. Starin, June 6 p 49

### Sanborn Co.:

N/C Language Uses 'Plain Talk' to Program Turret Drill Jobs, by A. W. Young, Apr 4 p 94

### Scale Industry

Scales Tip '62 Record, Mar 14 p

### Sciaky Bros., Inc.:

Welder Rides 'Roller Skate', Mar We ding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Science & Research

ASTME Pushes Research Plan, by R. H. Eshelman, Feb 28 p 59 Countdown for Metalworking, by R. R. Kay, Mar 28 p 69 Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81 Cutting Costs With Automation, by R. H. Eshelman, Apr 25 p 105

Electronic Advances Unveiled, by F. J. Starin, Apr 4 p 58 Industry Chided for R & D Lag, by R. W. Crosby, Feb 21 p 110 Is R & D Seeding Growth? Feb 7 p 67 Is U. S. Behind in R & P.

S. Behind in R & D Race? R. H. Eshelman, Mar 21

Lead R&D Grows Product Crop, by

Lead R&D Grows Product Crop, by F. J. Starin, June 27 p. 50 Missiles Get the Billions as Civil-ian R&D Lags, May 2 p. 58 New Cameras Change Scientific Theory Into Industrial Fact, by J. J. McCafferty, Mar 14 p. 56 New Project May Cut Desaliniza-tion Costs, Feb 21 p. 105 New Technology Key to Casting Growth, by C. L. Kobrin, May 16 p. 56

trowth, by C. L. Kobrin, May 16 p 56; R&D Yields New, Better Solvents, May 23 p 99 Research Growth: Are We Overlooking the Best Stimulant? By E. C. Beaudet, May 16 p 134 Researchers Eye Manufacturing, by R. H. Eshelman, June 13 p 185.

Researchers to Study Metal Design, Output, by R. H. Eshelsign, Output, by R. H. Eshel-man, June 27 p 59 Scrapmen Bank on Technology.

man, June ...

Scrapmen Bank on Tecum.

Jan 31 p 30

\$17 Billion R & D Outlay for '63,
by K. W. Bennett, Jan 3 p 96

The Silent Force of Ultrasonics.

The Silent Force of Ultrasonics.

by W. N. Redstreake, Feb 28

by W. N. Reustrease, 199
8AE Meeting Is Launching Pad
for Space, Defense Research, by
H. F. Jones, Jan 24 p 25
Success in Research Can't Be
Bought, Jan 31 p 38

Wanted—More Ability to Adapt, May 9 p 119 Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83 Zine Coatings Step Up R&D, by J. J. McCafferty, June 20 p 58

### Scranton, Governor

State Capitals Awake to Problems of Industry, June 6 p 62

Mill Speeds Scrap Processing, Feb 28 p 82 Pig Iron Wages War With Im-ports, Scrap, by T. M. Rohan, June 13 p 100 Scrapmen Bank on Technology, Jan 31 p 30

### Screw & Bolt Corp. of America:

Treated Bolt Resists Loosening, Apr 25 p 134

### Scully-Jones & Co.:

New Tooling Halves Setup Time. May 23 p 75

### Seglants

Sealer Extends Rust-Free Life for Metallized Structures, by A. P. Shepard, Apr 11 p 69

### Sealed Power Corp.:

Borings Make Quality Castings, Jan 31 p 60

### Seaway Steel Div., See Roblin-Seaway Industries, Inc.

### Sharon Steel Corp.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, Jun 6 p 43

### Sheffield Div., See Armco Steel Corp.

## Shell Chemical Co.:

Adhesive Bonding Plus Riveting Lowers Structural Stresses, Jan 17 p 100

### Sherritt Gordon Mines Ltd.

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

## Shipbuilding

Computer System Makes 'Layout' on Tape for Cutting Contours, Jan 24 p 60
Report Attacks Navy Shipbuilding Costs, by R. W. Crosby, June 20 p 59
Sealer Extends Rust-Free Life for Metallized Structures, by A. P. Shepard, Apr 11 p 69
Shipbuilding Has Rough Sailing, by R. R. Kay, Mar 7 p 119

### Signode Steel Strapping Co.:

Inventory Problems 'Float' Away, Jan 17 p 132 Strapping Wraps Up Greater Sales, Feb 7 p 61

How Will Silver Rill Affect U. S. Prices? By F. J. Starin, June 6 p 47 Price Cloud Covers Silver Market, by F. J. Starin, Mar 21 p 47 Silver Nears 'Celling', by F. J. Starin, Jan 31 p 29

### Simca Automobiles

Chrysler Hunts Markets Abroad, by H. F. Jones, Apr 25 p 103

### Simkin, William E.:

New Set of Issues in Labor Bargaining, Jan 17 p 76

### Simonds Saw & Steel Co.:

Arc Melting Upgrades Mill, Mar 28 p 91

### James C. Sinnigen & Co.:

Why Are They Restless? Jan 3

### Sintering

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin, May 9 p 131

### SKC Research Associates:

New Status, New Uses for Ver-satile Metal Powders, by C. L. Kobrin May 9 p 131

### SKF Industries, Inc.:

'Location 20' Links SKF, Vend-ors, Mar 21 p 110 SKF Rolling Bearing Research Plant Opens, June 20 p 62

### Sloan Valve Co.:

Pushbutton Foundry Pours Brass, Apr 4 p 91

### A. O. Smith Corp.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Snyder Corp.:

Transfer Line Speeds Output of Complex Aluminum Parts, Mar 21 p 76

### Snyder Limited:

Latin Market Ripe for Presses, by R. H. Eshelman, Feb 21 p 123

### Solvents

R&D Yields New, Better Solvents, May 23 p 99

### Spain

Pig Iron Wages War With Imports, Scrap, by T. M. Rohan, June 13 p 100

### Specialty Controls Group, See General Electric Co.

### Spencer Stuart & Associates, Inc.:

Handling Executive Weakness, Jan 10 p 37

### Sports

Ford Backtracks for Ideas, by H. F. Jones, Mar 28 p 67

### Stainless Steel

Corrosion Fight Aids Stainless, by H. F. Jones, Jan 24 p 41 Drilling Test Points the Way to Stainless Machinability, Jan 24

J & L Tosses Hat in Trim Ring, by H. F. Jones, Apr 18 p 85 Stainless Alloy Takes New Form,

Mar 21 p 74 ainless Holds Up Under Heat,

Mar 21 p 74
Stainless Holds Up Under Heat,
Jan 10 p 62
Stainless Makers Juggle Prices,
by G. J. McManus, Feb 28 p 39
Thin Stainless Drawn Extra Deep,
by A. W. Young, Apr 25 p 130
Why Stainless Prices Were Cut, by
G. J. McManus, Jan 10 p 26

### Stamping Industry

Stampers Battle Backlog Jam, by K. W. Bennett, Apr 25 p 96

### See also Presswork

### Standard Pressed Steel Co.:

Titanium Bolts Roach New High, May 16 p 94

### Standards

AISI Revises Tool Steel Ratings to Reflect New Technology, by C. L. Kobrin, May 30 p 134 Differing Standards Hamper Ex-ports, Feb 28 p 42 Drive to Improve Defense Buying Advances Into New Stage, by F. J. Cathey, Feb 14 p 60 Quality Program Set for Alumi-num Doors, Feb 28 p 106 Tighter Gear Standards Coming May 23 p 70

### The Stanley Works:

Line Managers Play New Plan-ning Role, by Ray H, Bartlett, May 30 p 111

Better Ways to Build Better With Metals, Jan 3 p 100 Builders Again Led Steel Users, May 2 p 42 Steel Is Victim Not Villain, by R. W. Crosby, May 9 p 108 Users Build 60-Day Steel Supply, Feb 14 p 51

### Steel, Bending & Forming

Explosives Form Without Dies, Jan 10 p 59 Extrusion Closes in on Thin Steel Sections, by J. H. Rice & L. M. Christensen Mar 21 p 71 Low Energy Rate Forming Unit Cuts Cests for Short Runs, May 2 p 76 Stailless Alloy Takes New Form

Citis C-5.

2 p 76

Stainless Alloy Takes New Form,
Mar 21 p 74

Steel Bars Climb to 400,000 Psi,
by C. L. Kobria, Feb 7 p 85

Tomorrow's Tooling: Lessons from
Space, by R. H. Eshelman, Apr
18 p 101

### Steel. Treatment

'Freezer' Makes Metals Stable, Feb 14 p 89

### Steel Industry

Are Fence Sitters Set to Jump?
By K. W. Bennett, Jan 10 p 23
Baildup Lags Behind '62 Pace,
May 16 p 52
Coast Mills Predict '63 Gains by
R. R. Kay, Jan 10 p 40
Cultivate a Market; Harvest It, by
G. J. McManus, June 13 p 103
Depreciation Rise Lowers Profit,
by R. D. Raddant, Feb 7 p 57
Farwest Set to Lure Industry, by
R. R. Kay, Feb 28 p 57
Financial Analysis 1962-1961, Mar
28 insert following p 58
Have Steel Wage Talks Started?
By G. J. McManus, Jan 17 p 67
Hoffa Maps Goals for Unions,
Blasts Senile Leaders by J. J.
McCafferty, Mar 7 p 97
How U. S. Lost Place in Global
Steel Race, May 23 p 41
Imports Plague Farwest Mills, by
R. R. Kay, Mar 14 p 69
Industries Line Up for Price
Probers, by R. W. Crosby, May
23 p 35
Inventory Problems 'Float' Away,
Jan 17 p 132

23 p 25
Inventory Problems 'Float' Away,
Jan 17 p 132
J&L Makes Major Management
Changes, May 2 p 45
Labor Talks Timetable Advanced
by Kaiser Payout, Price Hikes,
by G. J. McManus May 2 p 37
'Local' Human Relations Backstop
Big Steel's Effort, by J. J. McCafferty, May 30 p 91

Metals Industry Braces for New Antitrust Assault from U. S., by R. W. Crosbly, Apr II p. 37 Midyear Metalworking Forecast, June 13 p. 119 Plant Spending Is on the Move, by J. D. Baxter, Mar 7 p. 111 Price and Production Data, Jan 3 p. 157

Price and Production Data, Jan 3 p 157
Price Hearings Move in Circles, by R. W. Crosby, May 2 p 39
Price Hike Lifts Steel Hopes by G. J. McManus. Apr 25 p 91
Price Is 'Weapon', House Told, by R. W. Crosby, June 20 p 60
Prices: How Much More in '642
Answer Is in the Marketplace, App 25 p 89
Showdown Nearing for Steel Labor? By G. J. McManus, May 23 p 39
Soft Coal's Soft Sell in Labor, by G. J. McManus, May 16 p 54
Steel's First Earnings Anemic, Present Pace Unrealistic, by G. J. McManus May 9 p 101
Steel Gets Support on Dumping, by R. W. Crosby, May 16 p 57
Steel Imports Crowd Farwest, by R. R. Kay, May 9 p 116
Steel Labor Outlook Is Fluid, by G. J. McManus, Jan 3 p 95
Steel Leaders Avoid Rocking Labor Boat, by R. D. Addant, May 30 p 96
Steel Leaders Avoid Rocking Labor Boat, by R. D. Raddant, May 30 p 96
Steel Pact Is Triumph For Human

p 96 Steel Pact Is Triumph For Human

p 96
Steel Pact Is Triumph For Human Relations Bargaining, by G. J. McManus, June 27 p 43
Steel Fact Likely Without Reopening by G. J. McManus June 13 p 101
Steel Price-Hike Gathers Momentum Under Caution Light, by G. J. McManus, Apr 18 p 71
Steel Profits Dropped 16 Pet, But Depreciation Rose in '62, by G. J. McManus, Apr 28 p 57
Steel Ready to Charge Problems, by T. M. Rohan, Jan 31 p 28
Uncertainty Grips Steel Labor, by G. J. McManus, Apr 11 p 39
Week of Decision in Steel Labor, By G. J. McManus, Apr 11 p 39
Week of Decision in Steel Labor, By G. J. McManus, Mar 14 p 51
Wheels In Motion to Curb Steel Dumping, Apr 11 p 41
Wheels In Motion to Curb Steel Dumping, Apr 11 p 41
Will Steelworkers Try for Industry-Wide Kniser Plan? By G. J. McManus, Feb 14 p 49

### Steelmaking

Continuous Testing Coming for Steel? By J. J. McCafferty, Apr

Continuous Testing Coming for Steel? By J. J. McCafferty, Apr 18 p 75
Cryogenies: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81
How Digital Computer Controls Oxygen Steelmaking Unit, by E. J. Borrebach, Mar 21 p 78
Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43
Oxygen Leads Steel Progress, by C. L. Kobrin, Apr 11 p 44
Scrapmen Bank on Technology, Jan 31 p 30
Sensors Promise to Close Loop on Control of Molten Metal, by W. N. Redstreake, June 27 p 73

### The Stewart Coach Industries, Inc.:

Plastic Panels: Light and Rigid, June 20 p 96

### Stockpile, See Purchasing, Government

### Storage, See Warehousing

### Structural Steel

Fabricators Wave Caution Flag, by K. W. Bennett, June 6 p 50 Portable Tools Speed Assembly of Structural Steel Parts, by Harry Conn, Jan 10 p 60 Sealer Extends Rust-Free Life for Metallized Structures, by A. P. Shepard Apr 11 p 69

### See also Construction

### Studebaker Corp.:

wks, Larks Fly Into Spring, by H. F. Jones, Apr 11 p 51

### Superior Plating, Inc.:

Chemical Plating Works Quickly on Plain or Intricate Parts, May 23 p 72

### Surface Combustion Div., See Midland-Ross Corp.

### T

Business Taxes: Let's Work With
What We Have, by E. C. Beaudet, May 9 p 200
Depreciation Rise Lowers Profit,
by R. D. Raddant, Feb 7 p 57
Canada's Discriminatory Taxes
Hit U. S. Industry Hard, June
27 p 46
How Much Depreciation Loss?
Jan 17 p 75
Incentives: Is the Consumer
Played Out? By E. C. Beaudet,
June 20 p 144

Played Out? By E. C. Beaudet, June 20 p 144
JFK to Congress: Cut Taxes or Risk Slump, Jan 24 p 29
New Program Off to Bumpy Start, by J. J. McCafferty, Feb 14 p 54
President Maps Tax Cut Route, by R. W. Crosby, Jan 17 p 65
Reform Program Hits Congressional Snag, by R. W. Crosby, Jan 31 p 27
Steel Profits Dropped 16 Pet, Rut Depreciation Rose in '62, by G.
J. McManus, Mar 28 p 57
Tax Cuts, Yes Reforms No, by R. W. Crosby, Feb 14 p 53

### Taylor Instruments Co.:

Controls, The Vital Link to Pro-ductivity, by W. N. Redstreake, June 20 p 83

### TEK Bearing Co.:

Distributor Is One-Stop Mart, Apr 18 p 169

### Television

TV Finds Flaws Inside Tubing, by A. W. Young, June 27 p 76

### Testing & Inspection

Continuous Testing Coming for Steel? By J. J. McCafferty, Apr 18 p. 75
Dual System Analyzes Metals at Fast Production Pace, by J. P. Irwin May 16 p. 90
Europeans Push Automatic Gaging, by R. H. Eshelman, June 6 p. 53
Instant X-Rays Pinpoint Flaws in Fusion-Welded Pipe, by W. N. Redstreake, May 2 p. 69
Light Locked in Glass Fibers Finds Hard-to-Reach Flaws, by P. C. Chapin, Jan 17 p. 105
New Unit Detects Trace Metals, Mar 28 p. 90
Quality Program Set for Aluminum Doors, Feb 28 p. 106
The Silent Force of Ultrasonies, by W. N. Redstreake, Feb 28 p. 69
Sound Reveals Stress Patterns.

p 69
Sound Reveals Stress Patterns,
Jan 31 p 58
Tape Simulates Engine Runs, by
R. H. Eshelman, Feb 7 p 90
TV Finds Flaws Inside Tubing, by
A. W. Young, June 27 p 76
Twin Tests Double-Check Pipe to
Catch Marginal Flaws, by W. A.
Black, May 9 p 142

### Texas Alloy Products Co.:

Granular Metals Raise Speeds in Automatic Overlaying, May 30

### Thermatool Corp.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Thompson-Ramo-Wooldridge, Inc.:

Intellectronics' and Management, by R. R. Kay May 30 p 106 New Product Success Built on Old Know-How, by T. M. Rohan, May 9 p 120 Numerical Control Tools Poised for a Big Jump in Numbers, by R. H. Eshelman, Jan 31 p 25

### Thrall Car Mfg. Co.:

Weld Cleaning Time Tumbles, Apr 11 p 78

### Time-Trol, Inc.:

Controls, The Vital Link to Pro-ductivity, by W. N. Redstreake, June 20 p 83

## Timken Roller Bearing Co.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43

Shortage, Red Buys May Boost Tin Prices by F. J. Starin, Apr 25 p 93 Tin-Alloy Toughens Car Engines, by H. F. Jones, Apr 4 p 65

Billing Delayed on Tinplate, Feb 28 p 40 Tinplate Gets 'Instant' Anneal, Apr 25 p 129

### Tires

**Tinplate** 

Rubber Closes Record Year; Hunts New Uses, New Markets, by T. M. Rohan, Jan 17 p 63

### Titanium

Grinding Takes on Superalloys With New Ultrasonic Assist, by J. E. Sandford Apr 25, p 121 Titanium Bolts Reach New High, May 16 p 94 Will Industry Turn More to Tita-nium? Jan 17 p 136

### Tocco Div., See Ohio Crankshaft Co.:

Todd Shipyords Corp.: Computer System Makes 'Layout' on Tape for Cutting Contours, Jan 24 p 60

### Tool Steels

AISI Revises Tool Steel Ratings to Reflect New Technology by C. L. Kobrin, May 30 p 34

### Tools

How Good Is Plastic Tooling? Feb

21 p 136 Portable Tools Speed Assembly of Structural Steel Parts, by Harry Conn, Jan 10 p 60

### Tools, Cutting

Bar Cuts Hard-Surfaced Parts, Feb 21 p 139 Boring Mill Shapes Big Sphere, by R. H. Eshelman, May 30 p 128

Computer Plots Cutting Logic, by T. B. Menly, Apr 18 p 112
Computer System Makes 'Layout' on Tape for Cutting Contours, Jan 24 p 60
Cutting Tool Orders Move Up. by R. H. Eshelman May 2 p 53
Forming Orders Set Brisk Pace, by R. H. Eshelman, Feb 7 p 75
Specials': Profit or Grief? By R. M. Bednar, Jan 17 p 68

### Towler Bros., Ltd.:

Shop Dials for Uniform Forgings, by C. L. Kobrin, Mar 28 p 81

### Trade Associations

Directory of Trade Associations, Jan 3 p 179

### Training Programs

"Action Training" Develops Top-Flight Management—Fast, Apr 18 p 92

Flight Management—Fast, Apr 18 p 92 Engineers Go Back to College, by J. D. Baxter, Feb 21 p 108 Europe No Threat, Stampers Told by T. M. Rohan, Mar 28 p 47 How Good Is Company Trainins? June 27 p 61 The New Blue Collar Worker, by Lloyd Haney, Jan 3 p 142 Programming — New Fail-Proof Way to Train, by P. J. Cathey, June 20 p 72 Pas Share in Information Pool, Feb 28 p 102 Train Students Early for N/C, by R. H. Eshelman, Jan 24 p 43 Wanted: More Engineer-Leaders, by R. R. Kay Feb 7 p 73 Why Not Programmed Training? Jan 31 p 37

## Transportation

Costly Dock Strike Paralysis Spreads, by J. J. McCafferty, Jan 24 p 32 Industry Fights Off a Freeze, Feb 7 p 55

7 p 55 Mass Transit: Growing Market for Old Methods and Materials, by F. J. Starin, May 16 p 51 Metalworkers Eye SI Billion Pie, by R. R. Kay, Jan 17 p 73

### Transportation Equipment

Phat Spending Is on the Move, by J. D. Baxter, Mar 7 p 111 Transport Is Top Aluminum User, June 27 p 49

### See also Railroad Equipment; Shipbuilding

### TRG Inc.:

Welding Reacts to New Demands, by R. R. Irving, Apr 4 p 83

### Troy Tool Co.:

Machine Automates Short Runs, Jan 17 p 99

### Tube Sales Co.:

One-Stop Shopping for Materials, by K. W. Bennett, Apr 4 p 56

### Tungsten

Refractory Metals Gain New Status, by T. M. Rohan, May 9 p 107

p 107
U. S. Holds Tungsten Trump, by
F. J. Starin, Feb 28 p 43
Vapors Create Tungsten Joints,
May 23 p 76

Chrysler Revs Up Its Turbine, by H. F. Jones, May 16 p 65 Is the Turbine Just a Gimmick or the Next Auto Power Plant? By H. F. Jones, May 23 p 33 Turbine Meets Military Needs, by H. F. Jones, Mar 14 p 67

## U

## Udylite Corp.:

Cadmium Price Woes Dull Plating Outlook, by F. J. Starin, May

16 p 55 Nickel Plate Could Make Cents, by H. F. Jones, June 27 p 57

Grinding Takes on Superalloys With New U.trasonic Assist, by J. E. Sandford, Apr 25 p 121 The Silent Force Uitrasonic, by W. N. Redstreake, Feb 28 p 69 Surgical Cleaning Aids Missiles,

Surgical Cleaning Ands mission, Feb 28 p 80
Twin Tests Double-Check Pipe to Catch Marginal Flaws, by W. A. Black, May 9 p 142
Ultrasonic Machine Cleans Steel on a Continuous-Strip Basis, by A. W. Young, Apr 18 p 109

### Union Carbide Corp.:

Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin Mar 14 p 81 Growing Pains Catch Up With Industrial Gas Industry, by K. W. Bennett, Apr 18 p 76 Plasma Arc: A New Approach to Mechanized Welding, by R. R. Irving, Jan 10 p 49

Electroslag Unit Welds Plate, Feb.

7 p 98 The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28 p 69 S. p 69 . S, to Get Russian Casting Process, June 20 p 56

### United Aircraft Corp.:

Welding Reacts to New Demands, by R. R. Irving Apr 4 p 83

### United Engineering & Foundry Co.:

Mill Suppliers Rise to Meet the Revolution in Steelmaking, by Revolution in Steelmaking, by G. J. McManus, June 6 p 43 Shop Dials for Uniform Forgings, by C. L. Kobrin, Mar 28 p 81

### U. S. Industries, Inc.:

Latin Market Ripe for Presses, by R. H. Eshelman, Feb 21 p 123

### U. S. Rubber Co.

Plastic Panels: Light and Rigid, June 20 p 96

### U. S. Steel Corp.:

Alloy Steels Ride Growth Curve, by G. J. McManus, Feb 21 p 106 Billing Delayed on Tiaplate, Feb n 40

28 p 40 Continuous Casting Takes Off by G. J. McManus, Mar 21 p 46 Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin,

of Ultracold, by C. L. Kobrin, Mar 14 p 81
Europe No Threat, Stampers Told, by T. M. Rohan, Mar 28 p 47
Foam-Metal Construction Panels Shave On-Site Building Costs, Jan 10 p 52
Mar 10 p 52
Mar 10 p 54
Mar 10 p

### Vacuum Technology

Arc Melting Upgrades Mill, Mar

Arc Melting Upgrades Mill, Mar 28 p 91
Cryogenics: Industry's New World of Ultracold, by C. L. Kobrin, Mar 14 p 81
Defense Spurs Vacuum Treating, by G. J. McManus Jan 31 p 31
Lab-to- Shop Technology Gains, by C. L. Kobrin, Apr 18 p 78
Mill Suppliers Rise to Meet the Revolution in Steelmaking, by G. J. McManus, June 6 p 43
Vacuum Coatings Protect Steel at Temperatures Over 500 F. Jan

Temperatures Over 500 F. Jan

24 p 56
Vacuum Metallizing of Plastic
Sparks New Product Designs, by
L. A. Clement, Feb 14 p 86

Boring Mill Shapes Big Sphere, by R. H. Eshelman, May 39 p 128 Designers Fight Valve Fatigue With Sail Bath Treatment, by D. R. Dorff Jan 10 p 54 Pushbutton Foundry Pours Brass, Apr 4 p 91

### Venezuela

Youthful Democracy Faces Its Sternest Test, by Tom Camp-Sternest Test, by bell, Mar 21 p 54

### Verifax Lister, See Eastman Kodak Co.:

### Volkswagen

New VW Aims at Inroads Here, by H. F. Jones, May 2 p 51



### Wakefield Corp.:

New Lathe Speeds Spin Forming, by R. H. Eshe'man, Mar 14 p 71

### Wall Colmonoy Corp.:

Bar Cuts Hard-Surfaced Parts, Feb 21 p 139 Brazing Tackles New Jobs, by K. W. Bennett, Feb 7 p 60

### The Ward-Riddle Co.:

Drill System Keeps Holes True, Mar 21 p 84

### Warehousing

Builders Again Led Steel Users, May 2 p 42 Does Humidity Control Pay for Rust Prevention? June 27 p 80 Is Item Quantity Pricing Back? Mar 7 p 180

Mar 7 p 180
One-Stop Shopping for Materials,
by K. W. Bennett, Apr 4 p 56
Service Centers Prove Aid to PA,
May 16 p 125
Warehouse Goes to the Customer,
June 13 p 189

## Warner & Swasey Co.:

Drill System Keeps Holes True, Mar 21 p 84 Machine Tool Orders Ride High, Apr 4 p 53

### Washington Steel Corp.:

Continuous Casting Takes Off, by G. J. McManus, Mar 21 p 46

### Wastes, Recovery & Utilization

Boiler Restores Plating Baths, Feb 28 p 79 Borings Make Quality Castings, Jan 31 p 60 Mill Speeds Scrap Processing, Feb Process Salvages Gold on Plated Parts, May 30 p 132 Rust Converted to Useful Oxides, May 16 p 93

New Project May Cut Resaliniza-tion Costs, Feb 21 p 105

### Welding & Welding Machines

AWS Set for Show. Apr 4 p 98 Brazing Tackles New Jobs, by K. W. Bennett, Feb 7 p 60 Electron Beam Tames Production in Portable Welding Chamber, May 2 p 79 Electroslag Unit Welds Plate, Feb

7 p 98
Granular Metals Raise Speeds in
Automatic Overlaying, May 30

w to Build Reliability Into Welded Circuits, by C. R. Olsen, June 6 p 82

Welded Circuits, by C. R. Olsen, June 6 p 82
Instant X-Ray Pinpoint Flaws in Fus on-Welded Pipe, by W. N. Redstreake, May 2 p 69
Lab-to-Shop Technology Gains, by C. L. Kobrin, Apr 18 p 78
Magnets Control Weld Pressure For Precision Assembly, by R. H. Eshelman, June 20 p 94
Plasma Arc: A New Approach to Mechanized Welding, by R. R. Irving, Jan 10 p 49
The Silent Force of Ultrasonics, by W. N. Redstreake, Feb 28 p 69

by 69

p 69 Studs Welded Without Spatter, Mar 21 p 81 Submerged Arc Links Big Rails With Strong, Hard Welds, Mar

7 p 134 Tack-Welds Hold Fine Alignment,

June 13 p 140

Thin Stainless Drawn Extra Deep.
by A. W. Young, Apr 25 p 130

Three Ways to Form Cylinders
From Sheet Metal Stock, Feb 14

ner Controls Weld Energy, Jan

24 p 66 Weld Cleaning Time Tumbles, Apr 11 p 78 Welder Rides 'Roller Skate,' Mar

14 p. 89 Welding Eyes Untapped Markets, by J. J. McCafferty May 2 p. 44 Welding Reacts to New Demands, by R. R. Irving, Apr 4 p. 83 Which Process Should You Use for Automatic Welding? By H. B. Cary, Jan 17 p. 102

### Western Electric Co.:

Photo-Etch Forms Minute Parts, June 20 p 91

### Western Reserve University

Why Small Companies Succeed, May 2 p 57

### Westinghouse Air Brake Co.:

Push New Products Hard, Fast; Profit Life Span Shortens, by G. J. McManus, Feb 28 p 46

### Westinghouse Electric Corp.:

Automation Needs More Volume, by G. J. McManus, Mar 7 p 101 Computer Digests Shop Terms to Work Out Control Tapes, June

Computer Digests Shop Terms to Work Out Control Tapes, June 6 p 86
Controls, The Vital Link to Productivity, by W. N. Redstreake, June 20 p 83
Cryogenics: Industry's New World of Uitracold, by C. L. Kobrin, Mar 14 p 81
Forum Trades Tooling Ideas, by R. H. Eshelman, June 20 p 69
How Digital Computer Controls Oxygen Steelmaking Unit, by E. J. Borrebach, Mar 21 p 78
Magnet Turns Memory On, Off Feb 14 p 92
New Project May Cut Desalinization Costs, Feb 21 p 105
New Status. New Uses for Versatile Metal Powders, by C. L. Kobrin, May 9 p 131
Product Managers Push Sales, by T. M. Rohan, Mar 28 p 51
Satellite Motion Rig Orbits on Air Cushion, June 6 p 51
The Silent Force of Ultrasonics

Cushion, June 6 p 51
he Silent Force of Ultrasonics,
by W. N. Redstreake, Feb 28 Welding Reacts to New Demands by R. R. Irving, Apr 4 p 83

### Wheatland Tube Co :

Magnets Attracts Big Cost Sav-ings, May 9 p 191

### Wheeling Steel Corp.:

Steel Price-Hike Gathers Momen tum Under Caution Light, b G. J. McManus, Apr 18 p 71

### Whirlpool Corp.:

Low Energy Rate Forming Unit Cuts Costs for Short Runs, May 2 p 76 Tomorrow's Tooling: Lessons from Space, by R. H. Eshelman, Apr 18 p 101

### Whitehall Engineering Co.:

Gas Dryer Yields Brighter Steel, Mar 7 p 142

### W. A. Whitney Mfg. Co.:

Portable Tools Speed Assembly of Structural Steel Parts, by Harry Conn, Jan 10 p 60

### Williams & Co., Inc.:

Service Centers Prove Aid to PA May 16 p 125

### Clyde Williams & Co.:

Form-Metal Construction Panels Shave On-Site Building Costs. Shave On-S Jan 10 : 52

### Winschel, P. J .:

Path Through Price Law Jungle ls Narrow, Trap-Loaded, May 23 p 53

### Wintriss Controls:

Controls Prevent Die Damage, Apr

Granular Metals Raise Speeds in Automatic Overlaying, May 30

Automatic Overlaying, May 30 p 126
Price Is 'Weapon', House Told, by R. W. Crosby, June 20 p 60
Wire Rod Producers Lose Dumping Battle, June 27 p 43

### X

### Xcelite, Inc.:

Heat Treating by Modules, Apr 4 p 96

### X-Ray

Dual System Analyzes Metals at Fast Production Pace, by J. P. Irwin, May 16 p 90 Instant X-Rays Pinpoint Flaws in Fusion-Welded Pipe, by W. N. Red-streake, May 2 p 69

### Yale & Towne Mfg. Co.:

Do Special Lift Trucks Pay? By H. J. Hinckner, June 6 p 80

### Youngstown Sheet & Tube Co.:

Youngstown Plans Big Expansion at Chicago, June 6 p 51

### Z

Commercial Zinc Extruding Nears, by F. J. Starin, June 6 p 49 Corrusion War Boosts Zinc Ulse, by H. F. Jones, Mar 7 p 117 Zinc Coatings Step Up R&D, by J. J. McCafferty June 20 p 58

### Zirconium

Oxide Film Passes Fiery Tests as Refractory Heat Shield, Mar 21 p 82

## AUTHOR INDEX

## JANUARY-JUNE 1963

### B

### Bartlett, Ray H.:

Line Managers Play New Plan-ning Role, May 30 p 111

### Baxter, J. D.:

Engineers Go Back to College, Feb 21 p 108

Plant Spending Is on the Move, Mar 7 p 111 Pressures Mounting to Force New Look in Antitrust, Mar 14 p 54

## Beaudet, Eugene C .:

Business Taxes: Let's Work With What We Have, May 9 p 200 Canada's Course: A Difficult Route For Outsiders, June 27 p 116 Incentives: Is the Consumer Played Out? June 20 p 144 Mill for Indin: How Not to Sell Free Enterprise, May 23 p 108 More Ups Than Downs for '63, Jan 3 p 93 Must Business Yield More Competitive Data? Apr 4 p 140 Must We Relearn Hard-Learned Truth From Others? June 13 p 198

198
Patent Rights: What Is Best for the Public? Apr 18 p 178
Price Probes: Are They Missing the Point? May 2 p 116
Research Growth: Are We Overlooking the Best Stimulant? May 16 p 134
Restraint: Will All Sides Use the New Password? Apr 25 p 174
Stopping Gold Loss: Why Not Start from the Beginning? May 30 p 176
Will Congress Set Fringe Benefits, Too? Apr 11 p 120
Youth and Ideals: Business Has Plenty to Offer Too! June 6 p 128

## Bednar, R. M.:

Italy's Ripe for Automation, Feb 28 p 45
'Specials': Profit or Grief? Jan 17
p 68

### Bennett, K. W.:

Are Fence Sitters Set to Jump? Jan 10 p 23 Big Year in Building Equipment? Feb 28 p 41 Brazing Tackles New Jobs, Feb 7 Computers: Mature, But Growing, May 23 p 36

Definite Upswing for Abrasive
Grinding, May 9 p 105
Fabricators Wave Caution Flag,
June 6 p 50
Fuel Cells: They're Not Dead!

Cory, H. B.:
Which Pro
Automati
102

Apr 18 p 74
Growing Pains Catch Up With
Industrial Gas Industry, Apr 18

How to Avoid Pitfalls in Market-

ing Abroad, Mar 14 p 59 Industrial Loans Ease Cash Pinch,

Industrial Leans Ease Cash Pinch, Jan 10 p 30 Materials Handling Sales Rise, June 13 p 105 Merger Trail Can Be Fast Path to Growth But It takes Care, Feb. 7 p 68 New Contender for Can Market, May 2 p 40 One-Stop Shopping for Materials, Apr 4 p 56 Plasties Launch Space Drive, Feb. 14 p 52

14 p 52 Profit Lag Mars Press Sales, Mar 7 p 99 817 Billion R & D Outlay for '63,

an 3 p 96 Farm Tool Sales Take Root, '64 Farm Tool Sales 1aas May 30 p 93 Stampers Battle Backlog Jam, Apr

Stampers Battle Backlog Jam, Apr 25 p 96 Storm Flags Fly at Trade Fair, June 27 p 48 Total Quality Concept Is Goal, May 30 p 97 Unit Freight Method Picks Up Speed, June 6 p 48

### Black, W. A .:

Twin Tests Double-Check Pipe to Catch Marginal Flaws May 9 p 142

### Borrebach, E. J .:

How Digital Computer Controls Oxygen Steelmaking Unit, Mar 21 p 78

### C

### Campbell, Tom

Editorials, See Subject Index Land of Hope- in Need of Help, Apr 4 p 59 A Model for Latin America, Apr 4 p 42 A Time to Watch and Wait, Mar 28 p 48 Youthful Democracy Faces Its Sternest Test, Mar 21 p 54

### Caples, W. G.:

Building a Team Effort, Jan 3 p

Which Process Should You Use for Automatic Welding? Jan 17 p 102

### Caskey, Clark:

Why Office Workers Organize, Jan 3 p 139

### Cathey, P. J.:

Drive to Improve Defense Buying Advances Into New Stage, Feb 14 p 60 Programming — New Fail-Proof Way to Train June 20 p 72

### Chapin, P. C.:

Light Locked in Gass Fibers Finds Hard-to-Reach Flaws, Jan 17 p 105

### Christensen, L. M. & J. H. Rice:

Extrusion Process Closes in on Thin Steel Sections, Mar 21 p 71

### Clement, L. A.:

Vacuum Metallizing of Plastic Sparks New Product Designs, Feb 14 p 86

### Colson, H. H.:

Strip Floats Along Coating Line, Feb 21 p 142

### Conn, Harry:

Portable Tools Speed Assembly of Structural Steel Parts, Jan 10

### Covino, C. P.:

Lubricant Resists Thermal Shock, May 16 p 86

### Crosby, R. W .:

Ant'trusters Aim New Actions at Mergers and Foreign Ties, Jan 10 p 28
Can New Taft-Hartley Labor Panel Work? June 6 p 45
Congress Sharpens Budget Knife, Jan 24 p 28
Does Industry Lag? If So, Why? Feb 7 p 58
Dumping Complaint Cases Soar, May 9 p 166

May 9 p 106

FTC Survey Is Toned Down, But It Still Seeks Company Secrets, June 13 p 99
Hornet's Nest Awaits Congress, Jan 3 p 97
Industries Line Up for Price Probers, May 23 p 35
Industry Chided for R & D Lag. Feb 21 p 110
McClellan Rekindles Union Antitust Fire, Jan 17 p 66
Metals Industry Braces for New Antitust Assault from U. S., Apr 11 p 37
New Buy American' Policy Due Soon, May 30 p 95
Pentagon Tighten Contracting Rules, June 13 p 102
President Maps Tax Cut Route, Jan 17 p 65
Price Hearings Move in Circles, May 2 p 39
Price Is 'Weapon' House Told, June 20 p 60
Profit Refund Squeeze Coming, Jan 10 p 25
Reform Program Hits Congressional Snag, Jan 31 p 27
Report Attacks Navy Shipbuilding Costs, June 20 p 59
Right-to-Work Forces Battle Union Shop, May 2 p 43
Safeguards Needed for Contract Integrity, Apr 11 p 56
Steel Gets Support on Dumping, May 16 p 57
Steel Is Victim—Not Villain, May 9 p 108
Surplus Stockpile Plan OK'd by President, Feb 29 p 44
Tax Cuts, Yes—Reforms, No, Feb 14 p 53
Three Un Three Down in First Tariff Tests, Mar 21 p 48
Washington, p 11 all issues
Will Congress Put New Curbs on Growing Union Power? Feb 21 p 103

### D

### Datsko, Joseph & Alexander Henkin:

New Insight Into Machinability Gives Shop Men Simple Index, June 6 p 75

### Denise, Malcolm:

The Right to Manage, Jan 3 p 122

### Di Stefano, John:

Profits from Crash Programs, Apr 4 p 72

## Dorff, D. R.:

Designers Fight Valve Fatigue With Salt Bath Treatment, Jan 10 p 54

### Eshelman, R. H.:

ASTME Pushes Research Plan, Feb 78 p 59 Armour Seeks Broad Use of APT Language May 23 p 49 Automatic Coil Feeding Setup In-tegrates Stamping Lines, May 2

cegrates Stamping Lines, May 2 p. 72
Boring Mill Shapes Big Sphere, May 30 p. 128
Cutting Costs With Automation, Apr. 25 p. 105
Cutting Tool Orders Move Up, May 2 p. 53
Defense Streamlines Tool Setup, Feb. 14 p. 69
Europeans Push Automatic Gaging, June 6 p. 59
Expert Views World Tool Market, Jan. 10 p. 41
Foreign Tool Orders Add to April Gains, May 30 p. 107
Forming Orders Set Brisk Pace, Feb. 7 p. 75
Forum Trades Tooling Ideas, June

Feb 7 p 75 Forum Trades Tooling Ideas, June 20 p 69 Hydroform Improves Deep Draw

Jan 24 p 58 Is U. S. Behind in R & D Race?

ls U. S. Behind in R & D. Race-Mar 21 p 63
Lathe "Tailored" for Tape Raisea
Precision Levels, Apr 25 p 126
Latin Market Ripe for Presses.
Feb 21 p 123
Magnets Control Weld Pressure
For Precision Assembly, June

20 p 94
New Lathe Speeds Spin Forming,
Mar 14 p 71
Numerical Control Tools Poised
for a Big Jump in Numbers,
Jan 31 p 25

Orders Dip, But Optimism Stays, Mar 7 p 121 Rails Mechanize Machine Tools in a Load-Unload Network, May 16 p 81

16 p

16 p 81
Researchers Eye Manufacturing,
June 13 p 115
Researchers to Study Metal Design, Output June 27 p 59
Space Age Demands New Tools,
May 16 p 67
Tape Control Stars in Air Force
Film. Apr 11 p 53
Tape Simulates Engine Runs, Feb
7 p 98

Tape Simulates Engine Runs,
7 p 90
Thin Shafts Come Out Straight
After Precision Heat Treat, Mar
28 p 88
Tomorrow's Tooling: Lessons from
Space, Apr 18 p 101
Tool Industry Off to Good Start,
Jan 3 p 111
Tool Sales: New Testa Ahead, Apr
18 p 87
Tasting Un for a Moon Shot, Apr

18 p 87 Tooling Up for a Moon Shot, Apr

4 p 67
Train Students Early for N/C,
Jan 24 p 43

Train Students Early for N/C, Jan 24 p 43 Transfer Machine Flexibility Grows, May 9 p 117 Versatile Design Spurs Savings, Jan 17 p 85 Versatility Meets a Challenge, Jan 31 p 45 What's Next Automation Step? Mar 28 p 71

### Fay, W. A .:

Costs Are Blitzed by Value Analysis, June 13 p 104

### G

### Galt. John L.:

Advanced Planning Charts Path to New Markets and Profits, May 16 p 70

### Gaudet, Dr. F. J.:

What Makes Men Produce, Jan 3 p 129

### H

### Haney, Lloyd:

The New Blue Collar Worker, Jan 3 p 142

### Heimbach, Howard:

The Responsibility for Change, Jan 3 p 126

## Henkin, Alexander & Joseph Datsko:

New Insight Into Machinability Gives Shop Men Simple Index, June 6 p 75

### Hinckner, H. J.:

Do Special Lift Trucks Pay? June 6 p 80

### 1

### Irving, R. R.:

Plasma Arc: A new Approach to Mechanized Welding, Jan 10 p

Welding Reacts to New Demands Apr 4 p 83

### Irwin, J. P.:

Dual System Analyzes Metals at Fast Production Pace, May 16

### j

### James, Ralph:

Nylon Cast Into Big Gears, Feb 7 p 92

### Jones, H. F.:

Aluminum Realigns in Detroit, Feb 21 p 119 M: Akin Under the Skin? Feb p 55 Aluminum Autos Next? Feb 14 p 65 Auto Styles Go International, Jan

10 p 39 Best Seller: Chevy by a Mile, Jan 7 p 81 om Auto Sales Stir Detroit, Apr

11 p 40 Cashing Ir 9 p 115 In On Prestige Cars, May

9 p 115
Chrysler Hunts Markets Abroad,
Apr 25 p 103
Chrysler Revs Up Its Turbine,
May 16 p 65
Corrosion Fight Aids Stainless,

Jan 24 p 41 percesion War Boosts Zinc Use,

Jan 24 p.
Corrosion War Boosts
Mar 7 p 117
Detroit Won't Spare the Horses,
Jan 3 p 98
Economy Tooling Slashes Costs. June 20 p 67
Everyone Backs Up Warranties.

Backtracks for Ideas, Mar 28 p 67
Ford, Chevy Arm for '64 Fray,
May 23 p 47
GM to Push Chevy Sales in 1964,

GM to Push Chevy Sales in 1964, June 6 p 5? Hawks, Larks Fly Into Spring, by H. F. Jones, Apr 11 p 51 Is the Turbine Just a Gimmick or the Next Auto Power Plant? May 23 p 33 J & L Tosses Hat in Trim Ring, Apr 18 p 85 Mid-Year Models Catch On, Jan 13

p 43
ore Rapid Auto Style Changes
Keep Toolmakers Busy on '65s,
June 20 p 53
ew AM Process Fights Rust,
Mar 21 p 59
ew Frames to Aid Flexibility,

New Frames to Aid Flexibility, June 13 p 113 New VW Aims at Inroads Here, May 2 p 51 Nickel Plate Could Make Cents, June 27 p 57 Record Year for Truck Sales, May

Accord tens to the control of the co

Apr 4 p 65 Tool Spending by Automakers Due for Hike in 1964 Models, Mar 28 p 45 Meets Military Needs,

Mar 14 p 67 UAW Stiffens White Collar Push, May 23 p 38

may 23 p 38 Why Automakers OK UAW Study Plan, Apr 25 p 95 Will '63 Auto Sales Top '62? Jan 3 p 107

### Kay, R. R.:

Aerospace Profits Soar Upwards. Apr 4 p 68 erospace's Risks Can Hurt, Jan Aerospace's Risks Can Hurt, Jan 31 p 44 Air Freight Clear for Takeoff, Apr 18 p 88 Aluminum Paces Speed Classic,

Aluminum Paces Speed Classic, Feb 21 p 121 Automation Job Fund Pays Off, June 27 p 58 Car Smog Not Unique to Const, Jan 24 p 42 Coast Defense Work to Hold Up June 20 p 68 Coast Mills Predict '63 Gains, Jan 10 p 40 10 p 40 Countdown for Metalworking, Mar 28 p 69

28 p 69 Does It Pay to Bid for Every Job?

June 13 p 114
Douglas to Build Compact Jet,
Apr 25 p 106
Farwest Economy View Good, May
2 p 54
Farwest Set to Lure Industry, Feb
28 p 57

28 p 57 Hawaiians Eye Business Boom.

Hawaiians Eye Business Boom, Feb 14 p 67 How to Slash Paperwork Costs, Apr 11 p 52 Imports Plague Farwest Mills, Mar 14 p 69 'Intellectronics' and Management, May 36 p 106 Manufacturing Push Pays Off, Lines & & St.

Manufacturing Push Pays Off, June 6 p 58 Metalworkers Eye \$1 Billion Pie, Jan 17 p 83 Offer Employees a Wage Menu? Mar 21 p 61 Record Pace for Record Purse? May 16 p 66

May 10 p vo.

Shipbuilding Has Rough Sailing.

Mar 7 p 119

Sitting on a 86 Billion Backlog,

Jan 3 p 109

Stall Impacts Crowd Farwest, May

Steel Imports Crowd Farwest, May 9 p 116 2100-Mph Transport Brewing, May

48 1: More Engineer-Leaders, 23 p 48 Wanted: Mo Feb 7 p 78

### Kobrin, C. L .:

AISI Revises Tool Steel Ratings to Reflect New Technology, May

30 p 134 Cryogenics: Industry's New World of Ultracold, Mar 14 p 81 ECM Zeros-In on Heavy Jobs, Jan

p 95 r Metals: A New Adventure in Engineering Materials, Jan 24

p 53
Heat-Treat Line for Wide Plate
Accents 'Specialty' Trend, Mar
7 p 131
Lab-to-Shop Technology Gains
Apr 18 p 78
New Status, New Uses for Versatile Metal Powders, May 9 p
131

131 New Technology Kev to Casting Growth, May 16 p 56 Oxygen Leads Steel Progress, Apr

Oxygen Leads Steel Progress, Apr 11 p 44 Shop Dials for Uniform Forgings, Mar 28 p 81 Steel Bars Climb to 400,000 Psi, Feb 7 p 85 Switch to Pressure Pouring Up-grades Sand Castings, May 30 p 193

### Kuivinen, T. O.:

Can Ductile Iron Do Steel's Job? Jun 27 p 84

### M

### Mamzic, C. L.:

Tiny Jets Replace Moving Parts in Process-Control Devices, May 23 p 65

### McCafferty, J. J.:

Can 'Boulwareism' Survive Its Hardest Test? June 27 p 62 Continuous Testing Coming for Steel? Apr 18 p 75 Costly Dock Strike Paralysis Spreads, Jan 24 p 32 'Early Warning System': Can It Help Cure Labor's Ilb? Mar 21 p 48

Fly in the Walsh-Healey Oint-ment, Apr 25 p 92 Hoffa Maps Goals for Unions, ment, Apr 25 p 92 offa Maps Goals for Blasts Senile Leaders,

Human Relations Ba s Big Steel's Effort, May Back-

ew Frogram On to Bumpy Start, Feb 14 p 54 elding Eyes Untapped Markets, May 2 p 44 nc Coating Step Up R&D, June Zine

## 20 p 58 McManus, G. J .:

Alloy Steels Ride Growth Curve, Feb 21 p 106
Automation Needs More Volume, Mar 7 p 101
Big Step for Continuous Casting, Jan 24 p 27
Continuous Casting Takes Off, Mar

21 p 46 21 p 46 Cultivate a Market; Harvest It, June 13 p 103 Defense Spurs Vacuum Treating, Jan 31 p 31 Haye Steel Wage Talka Started?

Jan 17 p 67 dustry Drives to Put Realism Programs.

Jan 17 p 67
Industry Drives to Put Realism
Back Into Incentive Programs,
Jan 24 p 30
Labor Talks Timetable Advanced
by Kaiser Payout, Price Hikes,
May 2 p 37
Mill Suppliers Rise to Meet the
Revolution in Steelmaking, June
6 p 43

Revolution in Steelmaking, June 6 p 43 New Drive Behind Continuous Casting, Mar 14 p 53 Painted Steels Parade Lures Mil's to March, May 30 p 98 Price Hike Lifts Steel Hopes, Apr 25 p 91 Push New Products Hard, Fast; Profit Life Span Shortens Feb 28 p 46

28 p 46 Showdown Nearing for Steel Labor? May 23 p 39 Soft Coal's Soft Sell in Labor,

May 16 p 54
Stainless Makers Juggle Prices,
Feb 28 n 39
Steel Auditions Casting Methods,

June 20 p 56
Steel's First Earnings Anemic,
Present Pace Unrealistic, May
9 p 101
Steel Labor Outlook Is Fluid, Jan

3 p 95 Steel Pact Is Triumph For Human Relations Bargaining, June 27

p 43 Steel Pact Likely Without Reopen-ing, June 13 p 101 Steel Price-Hike Drive Gathers Momentum Under Caution Light,

Momentum Apr 18 p 71 Steel Profits Dropped 16 Pct, But Rose in '62, Mar

Depreciation Rose in '62, 28 p 57 Uncertainty Grips Steel Labor, Apr 11 p 39 Why Stainless Prices Were Cut,

Jan 10 p 26 Will Steelworl 'ill Steelworkers Try for Indus-try-Wide Kaiser Plan, Feb 14 p 49

### McManus, G. J. & Werner Zwick:

West German Dumping Defense Draws Rebuttal by U. S. Mills, Mar 14 p 51

## McMurry, Dr. Robert:

Unions Can Lose, Jan 3 p 149

## Mealy, T. B.:

Computer Plots Cutting Logic, Apr 18 p 112

## Miller, J. E.:

Furnace Upgrades Powder Parts to Meet Design Challenge, Mar 14 p 92

## 0

## Olsen, C. R.:

How to Build Reliability Into Welded Circuits, June 6 p 82

R

### Raddant, R. D.:

Depreciation Rise Lowers Profit, Feb 7 p 57 Steel Leaders Avoid Rocking Labor Boat, May 30 p 96 Week of Decision in Steel Labor? May 9 p 102

### Redstreake, W. N.:

Controls, The Vital Link to Productivity, June 30 p 83
Instant X-Rays Pinpoint Flaws in Fusion-Welded Pipe, May 2 p 69
Sensors Promise to Close Loop on Control of Molten Metal, June 27 p 73
The Silent Force of Ultrasonics, Feb 28 p 69

### Reel, H. C .:

Drawing Out New Ideas, Jan 3 p 146

### Rice J. H. & L. M. Christensen:

Extrusion Process Closes in on Thin Steel Sections, Mar 21 p 71

### Rohan, T. M .:

Autos Nudge Nuts. Bolt to '62 Record, Feb 21 p 107 Autos Rev Up Castings Sales, Jan 24 p 33 Bar Mills Launch Quality Drive, Jan 10 p 31 Europe No Threat, Stampers Told Mar 28 p 47

How Much Waste in Castings? June 6 p 46 New Product Success Built on Old Know-How, May 9 p 120 Ore Carriers Battle on Lakes With Dimes, June 20 p 57 Ore Mining Changes Studied, Jan

Orie Mining Changes Studied, Jan 3 p 99
Fig Iron Wages War With Imports, Scrap, June 13 p 100
Products Managers Push Sales, Mar 28 p 51
Profits Plague Appliance Men. Mar 14 p 58
Refractory Metals Gain New Status, May 9 p 107
Rubber Closes Record Year; Hunts New Uses New Markets, Jan 17 p 63
Steel Ready to Charge Problems, Jan 31 p 28
Tough Ore Market Yields Gains, Apr 25 p 94
URW Readies New Contract Demands, Feb 7 p 56

S

### Standford, J. E .:

Engineers Call Halt to Rejects, Feb 21 p 131 Grinding Takes on Superalloys With New Ultrasonic Assist, Apr 25 p 121

### Shepard, A. P.:

Sealer Extends Rust-Free Life for Metallized Structures, Apr 11 p

### Spatta, George:

Management's Forgotten Men, Jan 3 p 136

### Starin, F. J .:

Aluminum 'Bubbles' Over Can Market, Jan 17 p 69 Aluminum Pellets Form Sheets, Mar 7 p 102 Aluminum Takes Lid Off Can Goal, Mar 21 p 45 Cadmium Price Woes Dull Plating Outlook, May 16 p 55 Cmmercial Zinc Extruding Nears, June 6 p 49

Cmmercial Zinc Extruding Nears, June 6 p 49
Electronic Advances Unveiled, Apr 4 p 58
GSA Aluminum Bids Raise Shipping Point, June 20 p 55
How Will Silver Bill Affect U. S. Prices? June 6 p 47
Industrial Detectives Say It Saves to Pay, Mar 7 p 100
Industry Muffles Its Noise, May 2 p 41
Lead R&D Grows Product Crop, June 27 p 50

June 27 p 50
Mass Transit: Growing Market for
Old Methods and Materials, May

Old Methods and Materials, May 16 p 51 Patent Marketers Run Idea Ex-change, Feb 21 p 111 Price Cloud Covers Silver Market, Mar 21 p 47 Shortage, Red Buys May Boost Tin Prices Apr 25 p 93 Silver Nears 'Ceiling', Jan 31 p 29 U. S. Holds Tungsten Trump, Feb 28 p 43 U. S. Holds Tungsten Trump, Feb 28 p 43 Will Aluminum Hikes Spread? May 9 p 103 Will Copper Price Remain Stable? Mar 28 p 50

### Strasser, Federico:

Designing Sheet Metal Seams, Mar 28 p 86 Stamping Huge Shapes to Size, Mar 7 p 136

T

### Thompson, W. E.:

Front Line Controls Pinpoint Cost. Trouble Spots, Apr 25 p 110

W

### Wellauer, E. J.:

How to Predict Gear Life, May 9 p 139

Y

### Young, A. W .:

N/C Language Uses 'Plain Talk' to Program Turret Drill Jobs,

to Program Turret Drill Jobs, Apr 4 p 94 TV Finds Flaws Inside Tubing, June 27 p 76 Thin Stainless Drawn Extra Deep, Apr 25 p 130 Ultrasonic Machine Cleans Steel on a Continuous-Strip Basis, Apr 18 p 109

Z

### Zwick, W .:

Labor Rumbles Along the Rhine May 9 p 104

### Zwick, Werner & G. J. McManus:

West German Dumping Defense Draws Rebuttal by U. S. Mills, Mar 14 p 51

THE IRON AGE

A CHILTON



PUBLICATION

Chestnut and 56th St., Philadelphia, Pa. 19139

